Developing a Working Waterfronts Plan for Virginia's Coastal Zone

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Developing a Working Waterfronts Plan for Virginia's Coastal Zone

Executive Summary

Evaluation of Local Dependence Upon Critical Working Waterfronts

Detailed evaluations of the previously completed regional working waterfront inventories and discussions with local Planning District Commission (PDC) staff helped to determine particular sites or locales which were considered to be critical working waterfront or waterways and warranted more detailed evaluation.

Associated with three of the selected sites local planning authorities evaluated the facilities/waterfronts with respect to prevailing zoning and development potential to assist in identifying any imminent risks to the facilities continuation in its use as working waterfronts. The facilities assessed by local planning experts included a small commercial fishing waterway (*"Aberdeen Creek"*) in Gloucester County, Virginia, a marine railway (*"Ampro Shipyard"*) in Weems, Virginia and the working waterfront complex at *Willis Wharf,* Virginia.

Applied regional economic impact analysis was conducted for each of those three sites. Additionally a fourth "stand alone" economic study of a working waterfront in Hampton, Virginia (*"L.D. Amory & Company"*) was completed. The facility was selected for its local importance and based upon a large scale community redevelopment planning process just completed for the downtown Hampton waterfront (Appendix 7-*Economic Impact of Working Waterfront-Hampton, Virginia*, page 139).

Methods

Necessary financial information was assimilated for each location and that data utilized in conducting the individual IMPLAN economic impact modeling. These were completed using secondary data or baselines and where possible actual ledgers from the facility with the IMPLAN default technical coefficients for the industry North American Industry Classification System (NAICS) code.

These studies examined respective local planning, zoning, and fiscal policies with the purpose of informing state and local leaders how best to support, protect, and preserve working waterfronts. The methodology included a review of zoning ordinances, assessment methods, taxes and exemptions; potential impediments and/or threats to site new or transfer ownership. The input received was synthesized with the outcomes of the assessment of current zoning and tax policies to present recommendations for planning and policy tools that are expected to assist with protecting and enhancing working waterfronts to the benefit of both the local community and working waterfront businesses.

Recommendations generally included options related to leadership and zoning policies, regular review to monitor regulatory and industry-related changes, options for technical and financial assistance, and outreach.

Findings

Specifically the three working waterfront planning and zoning assessments focused on:

Aberdeen Creek, Gloucester County

Aberdeen Creek is a shallow federally identified draft navigation channel that connects to the upper York River in Gloucester County, Virginia. It is a well-used harbor by commercial fisherman. Aberdeen Creek provides working waterfront support through use of a public boat landing and a private commercial property with additional support infrastructure, both of which are in need of repair and regular upkeep. The purpose of this report was to examine the feasibility of Gloucester County utilizing a Tax Increment Financing (TIF) approach to fund a dredging project along Aberdeen Creek (Appendix 1-F*inancing an Aberdeen Creek Dredging Project Using a Tax Increment Financing Approach*, page 5 and Appendix 2-*Aberdeen Creek Dredging Project-Restarting an Economic Engine*, page 53).

Weems, Lancaster County

The Ampro Marine Railway, in one form or another, has been repairing fishing and pleasure boats for more than a century in the village of Weems, located in Lancaster County on Virginia's Northern Neck. The railway has provided a unique infrastructure serving the repair and maintenance needs of most of Virginia's large commercial vessels fishing the Chesapeake Bay. The analysis examined local planning and zoning constraints as well as local fiscal policy implications for an existing or future commercial water dependent industry (Appendix 3-*Analysis of Select Working Waterfront Site, Weems/Ampro Marine Railway*, page 65 and Appendix 4-*Economic Importance of a Marine Railway to the Northern Neck of Virginia*, page 91).

Willis Wharf, Northampton County

The community of Willis Wharf is the heart of the eastern shore's burgeoning shellfish aquaculture industry. It is estimated to support more than 50% of the value of fish and shellfish produced on the eastern shore.

This study examined the planning, zoning, and fiscal policies of Willis Wharf with the purpose of informing state and local leaders how best to support, protect, and preserve working waterfronts. The methodology included a review of zoning ordinances, assessment methods, taxes and exemptions; potential impediments and/or threats to site new or transfer ownership; interviews with Northampton County representatives and parcels owners in Willis Wharf; and recommendations of tools to address the issues of concern expressed by the aquaculture business owners (Appendix 5-*Case Study of Willis Wharf Working Waterfront*, page 101 and Appendix 6-*Economic Activity Associated with Commercial Fisheries and Shellfish Aquaculture in Northampton County, Virginia*, page 125).

Appendix 1

Financing an Aberdeen Creek Dredging Project Using a Tax Increment Financing Approach

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Financing An Aberdeen Creek Dredging Project Using A Tax Increment Financing Approach

Aberdeen Creek Dredging Study, Tax Increment Financing Analysis and Feasibility Study

November 15, 2014

This research project, Task # 51 was funded by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant #NA13NOS4190135 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended.

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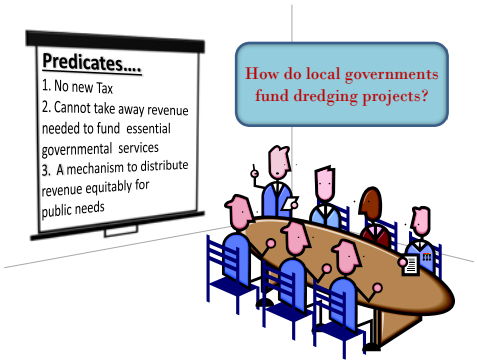
Executive Summary

The purpose of this report is to examine the feasibility of Gloucester County utilizing a Tax Increment Financing (TIF) approach to fund a dredging project along Aberdeen Creek, an important harbor for waterfront homeowners and commercial fishing operations along the York River. Historically, the Army Corp of Engineers financed and performed dredging operations for Aberdeen Creek and 16 other federal navigation channels located within the Middle Peninsula. In recent years funding cuts within the agency has led to local governments shouldering the full cost of dredging the channels within their borders.

Gloucester County leadership recognizes the economic importance of working waterfronts and requested that the Middle Peninsula Planning District Commission's Technical Assistance Program conduct a feasibility study of a public financing policy that could help the County pay for the costs of dredging and maintaining the harbor. County leadership mandated that the proposed policy;

- not raise revenue through a new tax
- not divert revenue used presently to fund essential services and
- distribute revenue equitably in a manner that serves the public need.



Tax Increment Financing approach or TIF meets these requirements and has been deployed by localities throughout Virginia with varying results. TIF is a financially sustainable, low-risk approach that Gloucester County can utilize to finance the dredging of Aberdeen Creek. Instead of raising taxes or diverting current spending, TIF allows municipalities to pay for public improvements using earmarked gains in future property tax revenue. In essence, TIF is a way for local governments to "cut the pie" differently to pay for needed public improvements.

With funding provided through the Virginia Coastal Zone Management grant program, grant number NA13NOS4190135, the Middle Peninsula Planning District Commission (MPPDC) partnered with Virginia Institute of Marine Science (VIMS) Shoreline Studies Program to conduct an analysis of the current conditions along the Aberdeen Creek channel including shoreline changes and infrastructure conditions. For purposes of this report, VIMS has provided an analysis of the sediment to be removed during the dredging project and based on its components, determine placement options for dredged materials.

Under the same grant, MPPDC also partnered with Virginia Sea Grants Program to provide assistance with TIF district modeling and revenue generation scenarios that could be used to help shape future TIF policy. The results from both studies are compiled into this report and will later serve as the foundation for a long range management plan for Aberdeen Creek.

This report provides an overview of TIF program and how it could be utilized to finance the dredging of the Aberdeen Creek through various traditional and nontraditional examples of how localities in Virginia are using TIF. The report details the existing conditions of Aberdeen Creek and its working waterfront infrastructure. Next, the report explains the cost associated with dredging the creek and the methodology employed in the Aberdeen Creek TIF district feasibility study to cover those costs. The report provides and compares the findings of the feasibility report for scenarios presented by deploying TIF using various district configurations. The final section of the report will provide recommendation on how to best deploy TIF utilizing other supplemental methods or revenue generation.

Aberdeen Creek

Aberdeen Creek is a shallow federally identified draft navigation channel that connects to the upper York River in Gloucester County, Virginia. A well-used harbor by commercial fisherman, Aberdeen Creek provides working waterfront support through use of a public boat landing and a private commercial property with additional support infrastructure, both of which are in need of repair and regular upkeep.[1] The waterfront property surrounding the creek consists primarily of single-family homes with private docks, as well as a defunct commercial processing facility that provides private docking facilities. The future site of the Commonwealth of Virginia's Middle Peninsula State Park borders the northeastern portion of the creek. The park's design includes a canoe launch on the eastern shore of the creek.[2] Based on the land use surrounding the creek and existing infrastructure within, it is clear that both the public and private sector have invested in Aberdeen Creek's function as a navigable harbor.

Aberdeen Creek's economic importance is derived from its geographic location and existing public infrastructure, which benefit homeowners and commercial fishermen alike. The Creek adds value to abutting properties which is further enhanced through construction and improvements made by property owners that include private docks and/or piers that provide access to a navigable waterway.[3] Aberdeen Creek's working waterfront provides watermen a strategic location for landing, docking, and mooring in close proximity to oyster and crabbing grounds on the Upper York River.[4] This proximity allows commercial fisherman to reduce transportation time and costs while contributing greatly to Gloucester County's maritime economy. Tom Murray, Associate Director for Advisory Services at the Virginia Institute of Marine Science is completing an economic impact study valuing commercial seafood as an industry for Aberdeen Creek. This study is scheduled to be completed in the Spring of 2015.

Deteriorating public infrastructure and shoaling are the two most significant threats to the continued use of Aberdeen Creek as a harbor. The public boat-landing site has been in use since the 1940's but has lacked a consistent maintenance schedule, which has resulted in deterioration of the two piers.[5] This deterioration has the potential to make docking, mooring, and unloading dangerous for boaters using the pier. Furthermore, the

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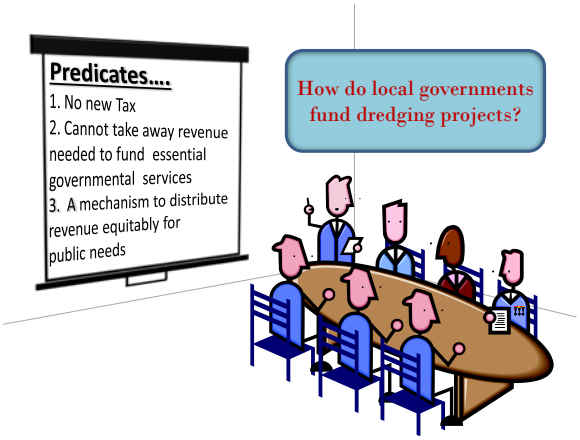
[1] Middle Peninsula Planning District Commission, *Aberdeen Creek Harbor Master Plan Draft Report*
[2] Virginia Department of Conservation and Recreation, *Middle Peninsula State Park Master Plan Executive Summary*
[3] Robert L. Hicks & Bonnie M. Queen, 2007. "Valuing Historical and Cultural Amenities with Hedonic Property Valuation Models," CRE Working Papers (Documents de treball del CRE) 2007/05, Centre de Recerca Econòmica (UIB ·"Sa Nostra"), revised Jan 2007.
[4] Middle Peninsula Planning District Commission, *Aberdeen Creek Harbor Master Plan Report*
[5] Middle Peninsula Planning District Commission, *Aberdeen Creek Harbor Master Plan Report*

existing two piers cannot serve the needs of most commercial fisherman, who contend that larger boat slips are needed to accommodate their vessels, assuming dredging issues can be addressed.

The greatest threat facing the viability of Aberdeen Creek as a harbor is shoaling, which over time prevents vessels from entering and navigating the waterway. Historically, the Army Corps of Engineers has dredged Aberdeen Creek to allow for its continued use as a harbor, with the Corps last dredging the creek in 1974. However, due to budget cuts, the Army Corp of Engineers will no longer finance the dredging of Aberdeen Creek, which is projected to cost between $608,000 and $1,592,000, depending on the life cycle of the dredging process.[6] Currently, the projected annual cost to dredge and maintain the creek is estimated at $93,000 annually. Unfortunately, there is no funding available in the Gloucester County budget to pay for continuous maintenance of the creek nor a continuous funding source available to assist the locality with subsidizing the dredging project. If dredging is not financed and shoaling continues unabated, Aberdeen Creek will cease function as a working harbor, decreasing the property values fronting the creek, frustrating the businesses of commercial watermen and weakening Gloucester diverse economic base.

Gloucester County leadership has historically recognized the economic importance of Aberdeen Creek's function as a working waterfront harbor and has taken numerous actions to see the working waterfront activity continue to thrive along the Creek. Most recently, Gloucester County commissioned the MPPDC to draft an Aberdeen Creek Harbor Master Plan that focused on identifying local code regulations impacting the use of working waterfront properties and infrastructure along Aberdeen Creek. The project was partially funded through Virginia Coastal Zone Management Program at the Department of Environmental Quality through Task 56, Grant #NA11NOS4190122 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration. As a follow up to the Aberdeen Creek Harbor Master Plan, Gloucester County leadership requested a public financing policy that could pay for the full cost of dredging the creek. County leadership directed that the proposed policy;

- not raise revenue through a new tax,
- not divert revenue used presently to fund essential services and
- distribute revenue equitably in a manner that serves the public need.



[6] Middle Peninsula Planning District Commission, *Shallow Draft Navigation and Sediment Management Plan for the Middle Peninsula Chesapeake Bay Public Access Authority.*

Given these mandates and the limitation of Virginia state law, Tax Increment Financing (TIF) is the most likely local policy option available to Gloucester County and is the subject of this report.

Tax Increment Financing (TIF) Overview

Tax Increment Financing (TIF) is an economic development tool that allows municipalities to pay for public improvements without raising taxes or diverting current funds, but rather through the earmarking of future property tax revenue within the area in which the improvements are to occur, known as the TIF district.[7] Authorized under Section 58.1-3245.2 of the Virginia State Code, TIF uses future revenue from property value increases to be allocated to projects in designated areas. A TIF district is created when a project need has been identified, the area in which the project will take place has been designated and funding is allocated through future tax revenue generation to finance the project. Specific parcels are outlined, composing the TIF district and the details of how the funding will be allocated are defined by the adoption of a policy by the local government. **Unlike special districts, it is not a new tax, but redirects and segregates the increased property tax revenues generated in a specific area to a specific purpose.** While traditionally, property tax revenue has been the only object of TIFs, personal property tax, sales tax and other fees have also been included to boost revenue generation.

Once a TIF district is established, a year establishing the base valuation for properties in that district is set, allowing for revenue generated from property value increases to be used to fund the project for which the district was created. In other words, the property values at the established year serves as the base line assessment value. Annual property tax revenue that exceeds the revenue of the specified year is deposited into the TIF district fund on an annual basis for the life of the project or until the debt for the project is paid.

The Virginia State Code provides TIF powers to localities with taxing authority, however, there are several ways local governments may create TIF districts. One way is through agreements between a locality and a third party entity commonly referred to as Community Development Association (CDA). In this case, local government creates the TIF district, however, the CDA is responsible for carrying out the guideline of the policy which are outlined in an agreement between the locality and the CDA. The CDA is responsible for ensuring that the project requirements are met.

Another way TIF districts may be created is through zoning code. Like overlay districts, localities may amend their codes to include a TIF district, however this is the least preferred method as it is very rigid and takes much longer to implement.

Most local governments in Virginia that have used TIF districts prefer TIF district creation by policy rather than through local codes and legislation. TIF by policy allows local governments the flexibility to establish multiple districts with variations in terms to meet the need for which each was established with amending local law. Revenues generated from TIF are projected to help determine the life of the district. Because most TIF districts have a life span that is also flexible, TIF creation by policy is more efficient than code amendments to amend the policy as needed and/or dissolve the district once the goals are fulfilled.

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[7] LISC Milwaukee & Council of Development Finance Agencies, *City of Milwaukee Tax Increment Financing White Paper & Recommendations.*

Creating a TIF District

The Virginia State Code authorizes local governments to adopt Tax Increment Financing districts and outlines the criteria for TIF districts in Section 58.1-3245.2 through 58.1-3245.4.

> *58.1-3245.2 allows for the governing body of any county, city or town to adopt tax increment financing by passing an ordinance designating a development project area and providing that real estate taxes in the development project area shall be assessed, collected and allocated in the following manner for so long as any obligations or development project cost commitments secured by the Tax Increment Financing Fund, hereinafter authorized, are outstanding and unpaid.*

Section 58.1-3245.3 requires that the ordinance creating the TIF district be provided to the real estate assessor and that the properties encompassing the TIF district are identified. Section 58.1-3245.4 outlines how funding creating under the TIF district may be obligated. State law does not limit the number of years TIF district may be in place.

Once authority has been established, a need for a plan or project has to be established before a policy is created. State law requires the governing body to hold a public hearing on the need for tax increment financing in the county, city or town prior to adopting a tax increment financing ordinance. Identifying specifically where and how the funds will be spent is the next step in the process and also a requirement of the state code. This step also involves public outreach.

A study outlining the projects timeline and associated costs should be conducted to determine if TIF is the most economically feasible method of financing the project. Factors such time and cost will also influence the rate at which allocations are set and possibly district area boundaries. The study should also include revenue projections and various scenarios based on economic changes.

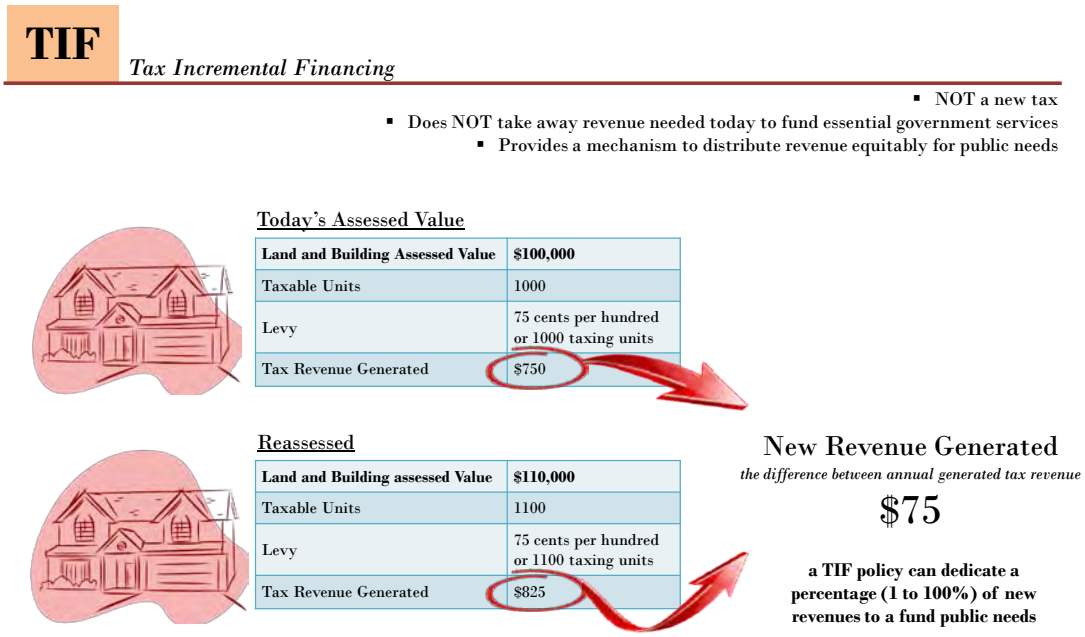
After the need has been establish and the goals and objectives of the project identified, the policy must be drafted and adopted. Localities in Virginia have favored enacting TIF districts through the adoption an ordinance outlining the details of the plan. As mentioned earlier, this method allows more efficiency and flexibility when monitoring the plan and ensuring objectives are met. Section 58.1-3245.3 requires that certain criteria be provided when creating the TIF district. These criteria are generally adopted as a part of the ordinance and are as follows:

A designated project area defined in a boundary map
Description of the properties included in the TIF district
The manner in which taxes will be collecting and allocated

The base valuation year is established in the ordinance as well as terms and timeline of TIF district and disposal of excess funds. Funding generated from the TIF district may be spent all or in part in that district, however, state law requires that the adopted ordinance outlines how the funds will be spent. Residual or excess funding (surplus) may go towards another project or into the general fund.

Project boundaries are generally determined by targeting those properties needing the benefit of the development of the district. Other factors such as pace of revenue generation to cover cost may also be a factor

in determining the boundaries. The law requires that the boundaries of the district are illustrated in a map as well as individually and the information be provided to the real estate assessment official. Once boundaries are chosen, base valuation of property tax for properties within the boundaries of the district are frozen. Tax revenue for the base evaluations continues to be allocated accordingly while the increased value above the base, or a portion thereof, is contributed to a TIF fund annually.



For Instance: A TIF policy could dedicate 50% of new revenues to a specific dredging fund. Therefore $37.50 would be directed to the dredging fund.

A process for monitoring and evaluating the performance of the district should be included in the plan. Monitoring should determine if TIF revenue generation is meeting targeted funding expectations or if other measures such as amending the allocation rate or providing supplemental funding methods will be required.

Examples of TIF Projects in the Commonwealth

TIF is popular throughout much of the United States and has experienced relative success in Virginia. It is frequently used in support of development and/or redevelopment projects capitalizing on the projected increase in property tax revenue from improvements and reinvestment in the district. Arlington County and Virginia Beach have successfully implemented TIF districts in the past decade. Traditionally TIF districts have been used to fund public infrastructure redevelopment projects. The following examples of TIF districts will provide more insight into how TIFs are being created, the type of projects they are being created for and how TIF is being supplemented to meet the goals of the project.

Arlington, Virginia has used TIF as a funding mechanism for several public projects since 2002 including three TIF districts created to fund public parking projects from 2002 to 2006. One of the most notable

Arlington TIF district was the Crystal City TIF district. In October 2010 Arlington County Board of Supervisors established the Crystal City TIF district, consisting of Crystal City, Pentagon City and Potomac Yards, to pay for transportation system upgrades and a street car system. (Appendix 1) Due to the high percentage of military and defense contractors in Arlington County, these areas experience significant impacts in terms of blight due the realignment and closure of military bases and other facilities. The Board's policy allocated thirty three percent of the annual increase in real estate tax revenue to the Crystal City TIF fund to infrastructure and transportation improvements. These improvements plant the seed for new investments and redevelopment in the project area, paying for itself over time through revenue from increased property values.

Other localities closer to the Middle Peninsula region that have experienced relative success with TIF include the cities of Virginia Beach, Chesapeake and Hampton. City of Virginia Beach has had as many as three TIF districts dating back to the late 1990's. The city used TIF as a means of spurring commercial and redevelopment growth with the Central Business District-South (Town Center) TIF district and the Lynnhaven Mall TIF district. The city also used TIF as a means to generate revenue for beach replenishment at Sandbridge.

Lynnhaven Mall TIF district was established in 1998 by the City Council of Virginia Beach as a public private partnership with the property owner to expand and revitalize the Lynnhaven Mall. At the time Lynnhaven Mall was the third largest shopping mall in Virginia and an important asset to the City's retail economy. The development was financed through a note between the developer and the City which required the developer to pay TIF eligible expenses upfront with reimbursement by the City over a 16 year period. The TIF was designed to contribute $11.5 million over a 16 year period to pay for remodeling the parking garage, upgrading the drainage system servicing the mall as well as improving public transit and roadway around the mall area. The note was paid in 14 years, two years above schedule.

The City of Hampton established a TIF district Peninsula Town Center which was administered through a Community Development Authority. The CDA received approximately $93 million in revenue generate through various funding methods including TIF districts, special tax districts and retail special assessment to assist with redevelopment of the Coliseum Mall. Public improvements included a parking structure and on site utilities and infrastructure associated with the project including, streets, sidewalks, drainage and utilities.

In 2004, Chesapeake City Council unanimously adopted the formation of a Greenbrier Area Commercial Tax Increment Financing (TIF) district through code amendment. Planned projects included improved pedestrian access, parking decks, City Park improvements, a new internal transit system and streetscapes. Parking garages, sewer and water lines, sidewalks, a bus line and even a full-service hotel are planned for the 1,920 acres that is officially the Greenbrier Area Commercial District in Chesapeake. The City Council authorized the TIF district to become effective beginning January 2005 for the life of the outstanding debt. Unlike in previous examples, no supplemental funding methods have been identified, explaining the indefinite term of the district.

One of the more unique instances of employing the TIF district where redevelopment and reinvestment are not direct outcome is the Sandbridge Beach TIF district in the City of Virginia Beach. The City of Virginia Beach used TIF district as one of several funding mechanisms to raise revenue for a sand and shoreline restoration project on its invaluable Sandbridge Beach. TIF funding was supplemented by federal cost sharing and creating a Sandbridge Special Services Tax District. Virginia Beach's use of the Sandbridge TIF district is very similar to the Aberdeen Creek TIF proposed later in this report, in that it is one of the more innovative ways of using TIF without reliance on the redevelopment aspect to increase revenue. Both are used to fund projects that were previously subsidized by federal funding.

Established in 1995, Sandbridge TIF district was devised to accumulate funding over a period of three years before being spent in order to fully fund a sand replenishment project rather than being spent as it was accumulated. The City funded the first sand replenishment in 1998 at a cost of $8.1 million to spread 1.1 million cubic yards of sand. The first federally cost-shared project was performed in 2003 at a cost to the City of $3.9 million to spread 2 million cubic yards of sand. In 2005, the federal government announced its intention to no longer participate in beach restoration projects and in 2006 funded the last $3.0 million sand replenishment project at Sandbridge. In 2007, the City paid $9.7 million of the $12.7 million total project costs to spread 2.1 million cubic yards of sand onto the beach. In 2009, $9.0 million in TIF revenues were declared to be in excess of the long-term obligations for beach and shoreline restoration. This amount was transferred to the General Fund to reduce the TIF fund balance to be in line with expected future project costs.

The cumulative assessment growth rate of the resort community of Sandbridge since the districts inception in 1997 to 2008 was 510%, more than double the citywide assessment growth rate due mainly to faster appreciation of the mostly residential properties within the District. The beach replenishments and the installation of sanitary sewers contributed largely to this growth. A term of the policy directs excess funds in the TIF to fund Capital Improvement Programs roadway projects.

These are a few examples of the methods employed by localities in the Commonwealth that include the creation of a TIF district. Majority of the TIF projects explained here used supplemental funding sources in addition to the TIF districts. There is an example of TIF by agreement however, majority of TIFs surveyed are implemented through the locality. Also commonly found throughout these examples are various supplemental funding mechanisms used to finance TIF projects.

Establishing the Need For A Dredging Project Along Aberdeen Creek

Dredging is the removal of sediment and debris from the bottom of lakes, rivers, harbors and other water bodies. Dredging is performed to a) maintain and deepen navigation channels for the safe passage of boats and ships or b) remove harmful contaminants from the body of water, a variation of dredging called environmental dredging. Aberdeen Creek is a shallow-draft Federal navigation channel that requires dredging in order for boats to pass safely in and out of the waterway. Besides information from users of the Creek, how do we know if a dredging project is necessary?

The User's Guide to Dredging in Tidewater Virginia created by the Middle Peninsula Planning District in 2011 through funding from Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant #NA10NOS4190205 Task 44 provides guidance on a dredging projects - from the identification of a dredging need, to identification of sediment disposal site, to applying for a dredging permit, to the dredging of a channel. The guide outlines the common components that factor into a successful dredging project within Tidewater Virginia as: (1) identification of a channel with a dredging need, (2) conducting a pre-dredge bathymetric survey to determine the current condition of the channel and volume of material to be removed, (3) identification and selection of a dredge disposal site, typically public or, private beaches and/or, private or public upland containment sites, (4)applying for and receiving the necessary permits via the submission of the Commonwealth of Virginia's Standard Joint Permit Application (JPA) and attendance, as necessary, at one or more required public hearings, (5) selection of a contractor and execution of the contract, (6) convening a pre-dredging conference with representatives from the appropriate regulatory agencies, (7) initiation and completion of the proposed dredging project, and (8) submission of a post-dredge bathymetric

survey to permitting authorities for determination of permit compliance. As each component influences the overall cost of a dredging project it is important that applicants, whether a public entity, private entity or a public private partnership, weigh the various options as federal funding to maintain shallow draft navigable waterways will likely no longer be available in the future.

With funding from the Coastal Zone Management Program, the Middle Peninsula Planning District partnered with Virginia Institute of Marine Science Shoreline Studies Program (VIMS) to assist in creating a master plan for dredging and maintenance of the Aberdeen Creek channel. The information provided through the work by VIMS will help to assess the dredging needs of the creek and better quantify the historic shoreline changes in the vicinity of Aberdeen Creek and the additional rate changes. This information will be used to better assess the future dredging needs of Aberdeen Creek.

The report will also provide an assessment of the current conditions of existing public and private infrastructure associated with working waterfronts along Aberdeen Creek.
Last, the report will include the results of a survey of the creek, producing bathymetric contours and sediment sampling to determine the depth and volume of dredging and the types of materials in the channel along the Aberdeen Creek area and options for placement of materials.

Methods used by the Virginia Institute of Marine Science's (VIMS) Shoreline Studies program coincide with the components identified in the dredging guide to help determine project need. The information by VIMS included in this report will address establishing the need through a survey of changes in the shoreline, identification of dredge materials and selections of disposal sites, required permits and the permitting process and the associated cost of dredging as well as maintenance of the existing working waterfront infrastructure along Aberdeen Creek.

Introduction and Statement of the Problem

Aberdeen Creek is located in Gloucester County, Virginia. A Federal navigation channel from the York River into Aberdeen Creek was established in 1962 (USACE, 1975). The one mile channel was dredged to 80 feet wide with a controlling depth 6 feet (Figure 2). Approximately 200,000 cubic yards of dredge material was placed in a tidal marsh complex about one mile upriver (Figure 2). Maintenance dredging was performed in 1974 when 68,000 cubic yards (cy) of material was placed upriver. No substantive maintenance dredging has since occurred. Today, narrowing of the channel at the entrance to Aberdeen Creek makes it difficult for ingress and egress of commercial vessels to the public landing at the end of Aberdeen Creek Road. The purpose of this project is to evaluate the working waterfront infrastructure (docks) and access at Aberdeen Creek.

In 2010, the USACE discontinued its long time maintenance program for Federal Channels in the Middle Peninsula and Northern Neck. In order to help localities transition to this significant change, the Corps developed the Shallow Draft Navigation and Sediment Management Plan for the Middle Peninsula Chesapeake Bay Public Access Authority. It outlined the various Federal channels, their history and a plan to utilize limited funding to target and coordinate projects including the beneficial use of dredge material. Sandy material is recommended for shore line protection within one mile up and down river of most navigation channels in the Middle Peninsula including Aberdeen Creek.

Methods

Historic Shore and Land Use Change

Utilizing the Shoreline Studies Program's Shore Evolution database, the historic shoreline change in the vicinity of Aberdeen Creek was described (Milligan *et al*., 2010). The Evolution database consists of ortho-rectified historic aerial photos for various dates between 1937 and 2009, and their corresponding digitized shorelines. These data are useful in determining sediment transport patterns at the channel as well as defining past disposal areas and possible future ones.

Assessing Waterfront Infrastructure

The working waterfront infrastructure at the end of Aberdeen Creek Road includes both public docks and a private commercial building. This assessment focuses on the public boat dock and the adjacent shoreline and their condition. VIMS personnel surveyed with a Real-Time Kinematic Global Positioning System (RTK-GPS). Horizontal and vertical control was established by processing a 2.7 hour occupation through the online positioning (OPUS). Data was converted to MLLW using the Shoreline Studies Program's Google Earth kml (Hardaway *et al*., 2010) file that depicts the elevation difference between MLLW and the 1988 North American Vertical Datum (NAVD88). At Aberdeen Creek, NAVD88+1.8 ft = MLLW. This survey of infrastructure along with ground photography is used to document site conditions. A series of photos can be found in Appendix A.

Survey and Sediment Sampling of the Navigation Channel

The Aberdeen Creek Federal Navigation channel was surveyed on June 12, 2014 using an Odom Hydrographic Echotrac sub-bottom profiler. The data was processed and the bottom reflector digitized in Chesapeake Technology, Inc.'s SonarWiz software. The data were adjusted to mean lower low water (MLLW) by interpolating time and tide level using predicted tide levels at Cheatham Annex and verified data at the Yorktown USCG Training Center gauge. The data were plotted as contours. Cross-sectional profiles were cut at various locations along the channel. The data were plotted in the Beach Morphology Analysis Program (BMAP) (Veri-Tech, 2014) and are shown in Appendix B. Volume calculations between the existing bottom and the dredge channel template were calculated with BMAP's volume function.

Sediment samples were taken along the Federal channel in Aberdeen Creek. Inside the creek, a hand auger was used to sample the bottom. Two samples were generally taken: one at the surface and one at depth to determine how far the material extends. Just outside the creek mouth, grab samples were taken of the surficial sediments. Each sample was given a field classification based on Unified Soil Classification System. Sediment samples were located with a hand-held GeoXH GPS unit.

The dredge channel template was located for this project by scanning the map from USACE (1975) and geo-rectifying in Esri Arcmap. As such, some error occurs in the placement of the channel template on the aerial photos and for the data analysis.

Results

Historic Shore and Land Use Change

In 1937, aerial imagery shows the entrance channel to be about 130 feet wide and oriented east – west as one enters from the York River. It then takes about a 90 degree bend to the north into Aberdeen Creek (Figure 3). Aberdeen Creek widens to about 700 to 800 feet for about 2,000 feet north of the entrance to where it divides into two branches, one continuing north and one going east. These two prongs narrow quickly and become narrow meandering tidal channels with adjacent marsh. The land use around the creek was mostly agricultural with a sparsely treed shoreline and a few houses on the creek. The west side of the creek is a peninsula that widens quickly north of the entrance. The north side of the entrance channel is defined by sand spit vegetated with high and low marsh. This feature has formed over the years of southward transport of eroding bank sediment along the York River. A sandy spit also occurs on the south side of the channel. This spit had moved across a small tidal channel/marsh coming into Aberdeen Creek from the southeast. At the time, no piers or docks existed along the Creek, and no road to the water is visible.

By 1953, a T-head dock can be seen just inside the entrance (Figure 4). This is likely one of the deepest part of the Creek at this time. A few piers also can be seen as well as shoreline infrastructure at the end of Aberdeen Creek Road, docks, wharfs and buildings to support the local seafood industry. A few more waterfront homes can be seen on the York River shoreline and on the east and west side of Aberdeen Creek as evidenced by the occurrence of piers. The north and south inlet spits had receded making the channel slightly wider.

In 1960, more housing along the York River and both sides of Aberdeen Creek can be seen. Remnants of the marsh fringe exist along the York, and a small dredged channel very close to the east side of Aberdeen Creek can be seen (Figure 5). The Federal navigation channel was dredged in Sep-Oct 1962, and a total of 200,290 cy were removed (USACE, 1989). Aerial imagery in 1968 shows the disposal site in an unnamed tidal creek/marsh about 1 mile north up the York River (Figure 6). The navigation channel template is now added to the imagery. The channel consists of two main sections as depicted by the U.S. Army Corps of Engineers (Figure 6). The out/inbound channel starts near the entrance to Aberdeen Creek and extends southwestward about 2,600 feet into the York River. The Aberdeen Creek leg starts at the creek entrance and extends northward to the public landing at the end of Aberdeen Creek Road, about 2,575 feet (Figure 2). A turning basin is included.

The channel was maintenance dredged (68,416 cy) in October 1974 (USACE, 1975) and deposited in the same disposal site. This may have been material from the entrance area of the channel where infilling is more chronic. Aerial imagery in 1978 shows more development along the York River and Aberdeen Creek (Figure 7). The bounding channel spits remained in about the same configuration.

By 1994, the north and south spits were advancing into the entrance channel as a sandy salient (Figure 8). Significant shoreline hardening northward along the York River coast was also occurring. This is evidenced by the lack of beach along the middle of the developed shore line to the north. Evidence also exists of shoreline hardening along the York River shorelines south of Aberdeen Creek. By 2002, much of the coast north and south had been hardened. Generally, this reduces the amount of sediment entering the river from the banks. Bulkheads also can have a reflective effect on incoming waves, causing scour and increasing sediment transport along the shoreline and nearshore. Sand continued to advance from mostly the north spit into the channel.

Sand transport along the nearshore is also a factor and consequent sand transport into the north side of the channel.

In 2006, the York River shoreline to the north has been further protected by a series of offshore breakwaters which may impact sand movement, reducing alongshore sands. However, the sand salient advancing from the north spit has closed over half of the established channel. Commercial boat traffic must swerve along the south side of the entrance channel. Aerial imagery in 2009 clearly illustrates the shoaling of the navigation channel (Figure 9). The out/inbound channel narrowed out 1,200 feet with infilling from both north and south. The near shore section within 400 feet of the entrance has significantly infilled mostly from the north, and the entrance has almost completely been blocked by the advancing salient from the north spit. Traffic must continue to use the naturally flowing channel along the south side.

Shorelines along the York River both north and south of the entrance to Aberdeen Creek have a history of erosion (Figure 11). The eroding bank sediments have over time been transported up and down river and have entered the mouth and created these spit features. The shorelines within Aberdeen Creek have a history of shoreline recession but at a much lesser rate. The construction of breakwaters north of Aberdeen Creek has resulted in a net positive shoreline change as indicated as accretion on Figure 11. The bulkhead south of the Creek has maintained the shoreline location as indicated by the very low erosion rate.

Assessing Waterfront Infrastructure

Two connected public boat docks are currently being utilized (Figure 12). These are two L-heads which almost meet. Each has a wide land section so trucks can back out to the narrower shore parallel docks. The truck docks are about 12 ft wide and built much stronger with 10 inch x10 inch cross beams on top of X braces connecting the pilings (Appendix A). The pilings and cross beams on the north dock have a riverward lean due to pressure exerted by exiting trucks. Wood bulkheads support the road where the wide docks come ashore. They are old and showing signs of decay. The L-docks are narrower and many of the cross-braces are decayed to a point where they offer no structural support, but the piles are still intact.

The shoreline between the two docks is about 70 feet long and occurs as an eroding upland bank with over hanging trees. Various bits of debris, bricks, bottles, etc. occur in the intertidal areas. The public shoreline south of the south dock has an old completely dilapidated small dock. The upland bank is scarped and extends from south dock about 60 feet to the adjacent stone revetment which continues along private property down creek. The backshore at the northernmost dock is +8.7 ft MLLW and climbs to +12 ft MLLW at the southernmost dock.

The bottom elevation survey indicates that northernmost section of the public dock is the deepest at -3.6 ft MLLW. However, the bottom depth decreases for the other section of docks. At the tip of the L of the southernmost dock, the elevation is only -1.5 ft below MLLW.

The adjacent private property is a series of seafood related structures which, over time, have fallen into serious disrepair. A shoreline survey was done along this waterfront along with documentation of site conditions by a series of ground photography (Appendix A).

Survey and Sediment Sampling of the Navigation Channel

Assuming the channel was initially dredged and subsequently maintained to a depth of -6 ft MLW then most of the channel has in filled over time (Figure 13). Entering the outboard channel toward Aberdeen Creek, the -6 contour occurs about 1,330 feet from red channel marker, and the depths get progressively shallower. Using the -3 ft contour as a guide, the shoaling becomes significant along the north side of the channel where depths go to -2 ft MLLW. There are also two elongated "holes" along the south side where the depths go to -7 feet. At the throat of the channel, the -2 ft contour resides in the middle of the Federal channel, but slightly deeper areas occur along the south side until finally entering Aberdeen creek with two or three more troughs measuring to -8 and -9 ft MLLW along the east side. Infilling of the channel in Aberdeen Creek increased toward the turning basin where depths of -3 ft MLLW are typical.

Cross-sectional profiles created along the channel depict the bottom elevations along Aberdeen Creek (Figure 14). The plots are shown in Appendix B. Overall, the cross-sections show that the channel is still functional, but has shifted and become more narrow in some areas, particularly at the throat. The area closest to the docks is very shallow. Between profile 152 and 786, very little of the original channel exists. Between 973 and 1678, the channel exists but will require dredging. Profile 2020 show the channel exists with the dredge channel template and is in fact deeper than the template. Profile 2178 shows the influence of the sand being transported into the channel from the north. The channel is nearly completely within the dredge channel template, but the deeper section has shifted south making the entrance still passable but not in a marked channel. Profiles 2251, 2326 and 2258 also show the infilling from the north by alongshore sediment transport. Profiles 2675 and 2964 are shoaled in from transport across the nearshore region with adjacent depths of -1.5 and -2.5 MLW respectively. Farther offshore, the profiles show that the channel is still generally within the dredge channel template. The channel is shallow closer to the creek mouth than farther offshore. Profile 3820 shows that the channel no longer needs dredged between it and the channel marker.

The locations of auger samples and surface grab samples are shown on Figure 14. The field classification of the samples is also shown. Material in the interior portion is mostly very soft black clays down to at least four feet. Coarse sands occur at the confluence of the Creek and the York River at shallow depths. Farther out into the York River fine sands with mud and clay are found.

Findings

Aberdeen Creek is a sub-estuary of the York River with a drainage area of about 3.26 square miles and about 3.4 miles of tidal shoreline (Figure 15). It resides in the Jones Creek-York River subwatershed. Three small millponds occupy the watershed. Due to the amount of natural flow, it is highly unlikely that the channel into Aberdeen Creek will completely close.

Sedimentation in and adjacent to Aberdeen Creek comes not only from eroding upland banks but also from runoff of adjacent agricultural lands. The distribution of bottom sediments is a function of source where fine material, silts and clays, are often supplied by upland runoff and sandier material from eroding banks sediment. The finer material is usually found in interior waters, sand at the channel entrance and a combination of fines and sands in nearshore region.

In their classification of the York River estuary, Dellapenna *et al*. (2003) found that in the area of Aberdeen Creek, the York River is non-depositional, and in some areas, erosional, between the River's main

navigation channel and the shoreline. In fact, the main navigational channel seems to be migrating toward the northeast shoreline as it fills in from the southwestern side. This can help account for the general lack of infilling in the farthest reaches of the Aberdeen Creek channel.

The 2.5 foot tide range in Aberdeen Creek allows passage for commercial vessels with drafts less than 2 feet within much of the Federal Navigation channel boundaries at MHW. Large vessels still need caution in making the turn at 2178. As the tide drops the Federal channel needs to be passed generally along the south side. Once in Aberdeen Creek the channel is passable to about 786 where the remainder of the Fed channel is -3 feet MLLW.

The maintenance dredging of Aberdeen Creek will involve two phases or at least two types of material, the sandy approach channel sediments and the soft clay within Aberdeen Creek. The sand appears suitable for beach nourishment whereas the soft clay will have to be disposed in an approved upland site. The Shallow Draft Navigation and Sediment Plan (USACE 2010) outlines the history of all Federally-maintained channels in the Middle Peninsula and Northern Neck. As part of the study for Middle Peninsula channels, the use of beach quality material is discussed. In the case of Aberdeen Creek, the York River shorelines 1 mile north or south of the channel might be appropriate. We have further identified areas that might be suitable for beach fill that is hydraulically-dredged (Figure 16). These are shown as site N-1 and S-1 where the approx. 12,000 cy of sandy material could be either split between the two or sent to just one. Acquiring permits and permission for these will require additional effort.

The conditions of the public facilities were assessed in terms of obvious structural defects. These were the wooden docks and bulkheads, and although some of the cross members are decayed along the L-section, the wharf is still usable. The bulkheads at the large dock/land interface are in bad shape as evidenced by occasional addition of fill to "washouts" (personal communication with Bubba). Generally, the cost to repair the heavy-duty section of the docks could cost approximately $\$50/ft^2$. The lighter-duty L-section of the dock could cost about half of that to repair or about $\$25/ft^2$. The bulkhead replacement will vary depending on the replacement method. If the bulkhead is replaced with a similar structure, it could cost $300-$350 per foot. However, a more cost-efficient method would be to use rock in front of the structure. This method could cost $250-$275 per foot and has the advantage of being a longer- term solution than bulkhead replacement. In addition, a living shoreline could be installed between the structures and between the second pier and adjacent revetment in order to prevent undercutting of the upland bank. The adjacent privately owned wharfs and building are in serious disrepair. Portions of the concrete capped wharfs have completely failed and are a hazard. Costs to repair/replace the wharfs and buildings were beyond the scope of this study but will be significant.

Finally, the ongoing need for working waterfront infrastructure and access will require innovative local solutions to each site. Various grant funding and other planning vehicles available to the MPPDC and its partners will be required to address the commercial need and the up and coming aquaculture industry to insure seafood viability for the Commonwealth.

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Photos of Aberdeen Creek

Page 1: Condition of public infrastructure
Page 2: Usage
Page 3: Condition of private infrastructure

Heavy duty construction consists of 10 in x 10 in cross-beams on the section of pier that is sued to load and unload.

The X braces seem to be intact on the heavy duty section of the dock.

The bulkhead that supports the paved ramp leading to the dock is decaying and needs replaced.

The remains of an old dock could be replaced with a living shoreline to stop the undercutting of the bank.

The L section of the docs have X braces that are in various stages of decay.

Commercial waterman use these facilities to offload their catch onto waiting trucks.

This barge is leaving with a load of oyster shells that were loaded at the private dock facility.

Many boats tie up to these docks.

A crabber leaving Aberdeen Creek with a load pf pots to deploy.

Temporary channel markers have been installed so that boats can find their way into the creek via the shifted channel.

The various sizes of boats that use the Aberdeen Creek docks.

Along one section of the bulkhead, oyster shell has been used to fill in behind the failing structure.

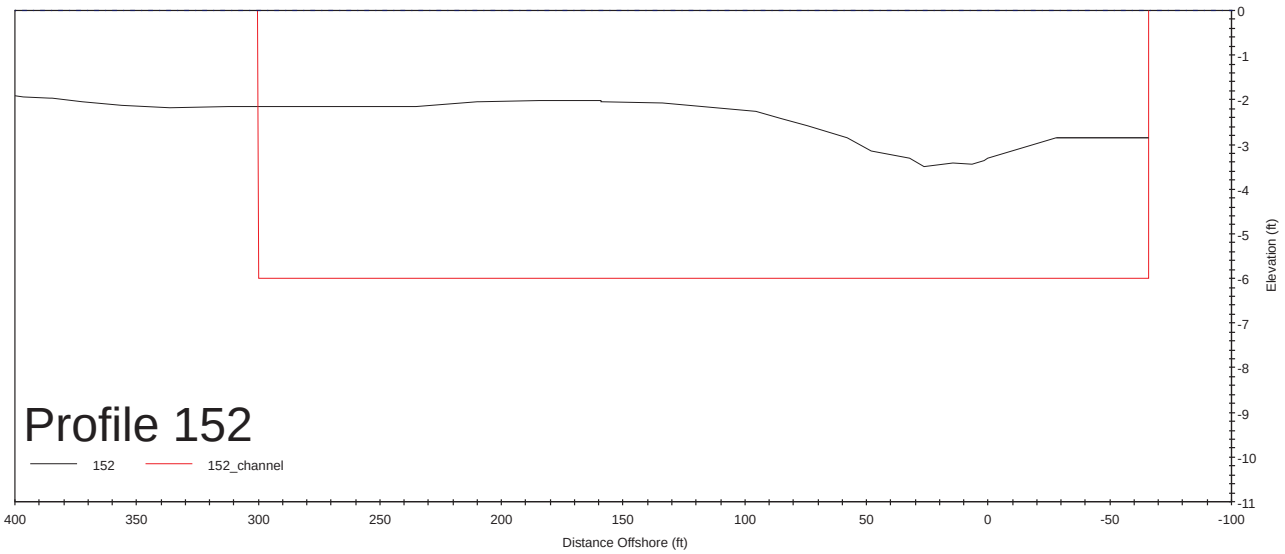
The concrete dock is in complete disrepair and is extremely hazardous. It is presently not in use.

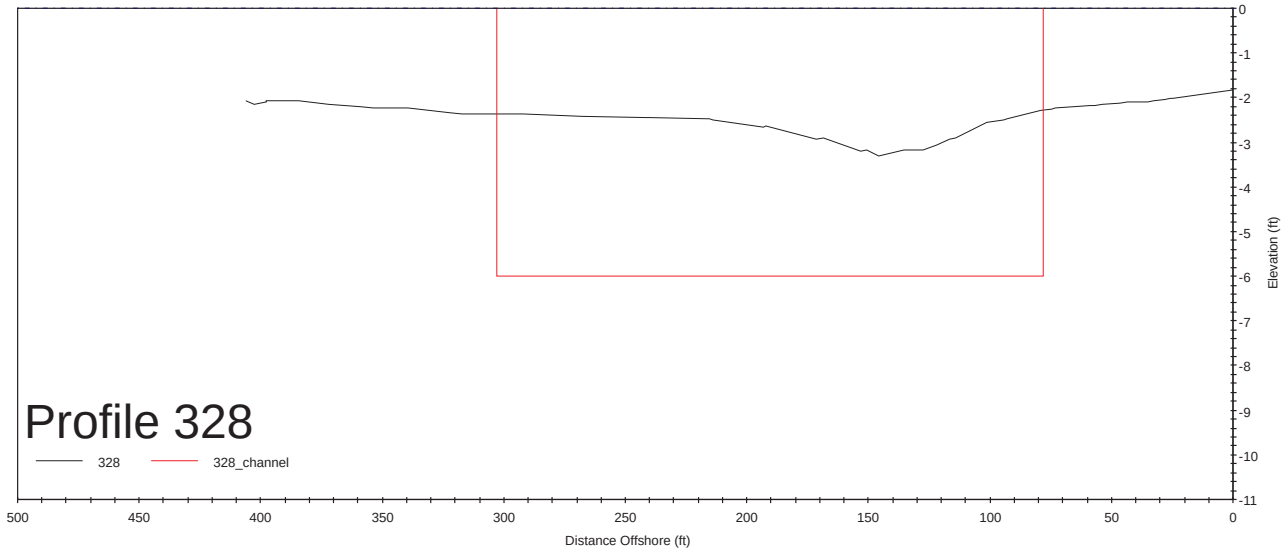
The bulkhead of the private facilities is failing even as minor attempts to stabilize occur.

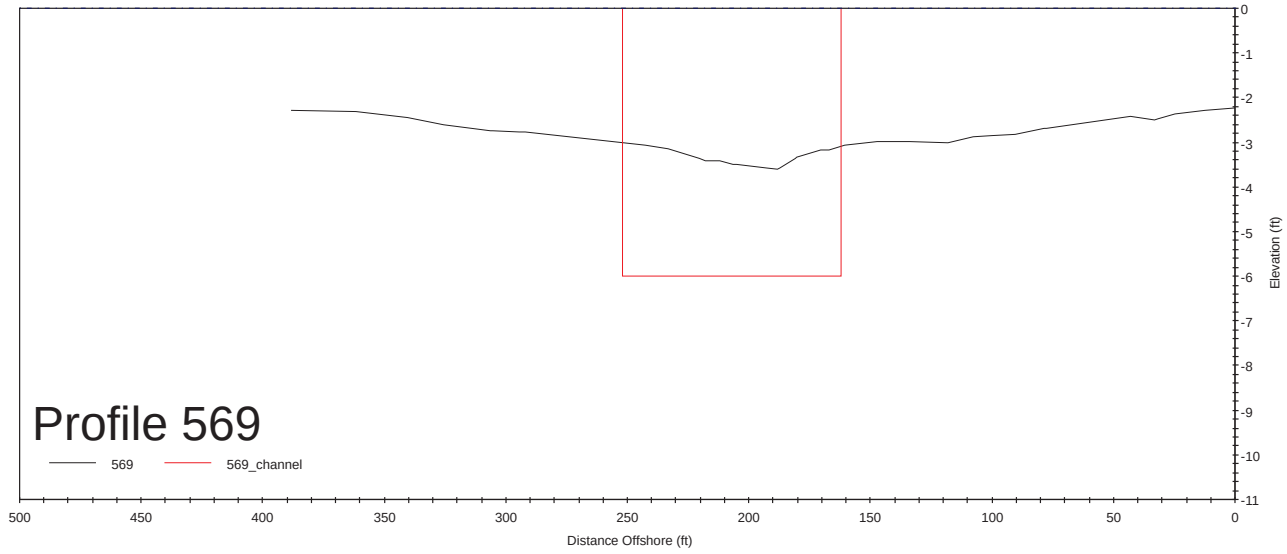
The processing facility is in near complete disrepair.

Dredge Channel Cross-Sections with Channel Template

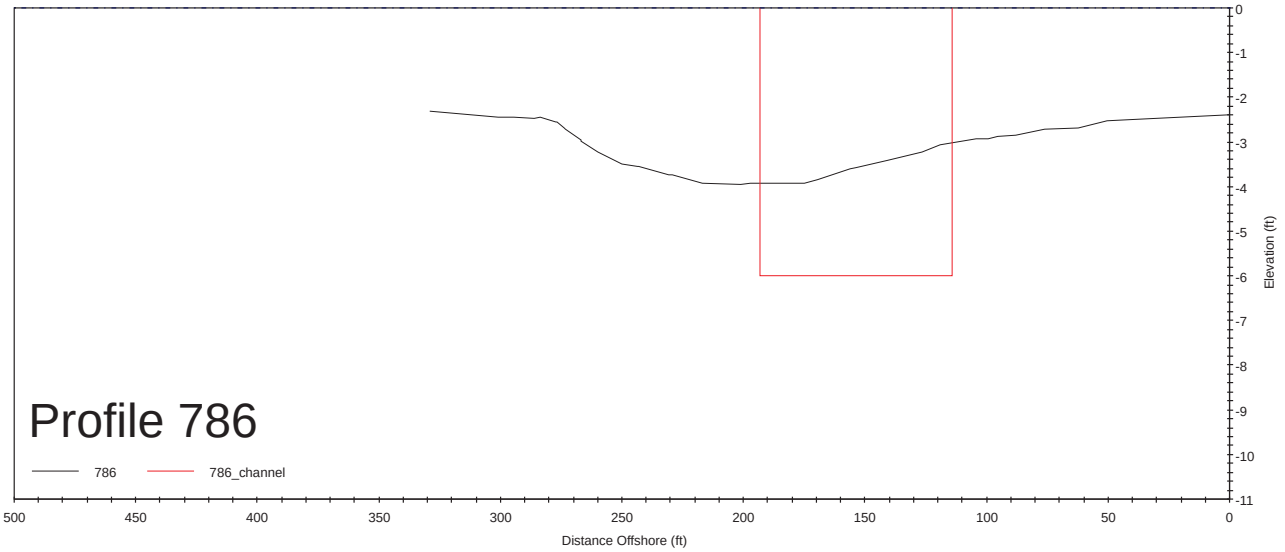
Aberdeen Creek Channel, MLLW

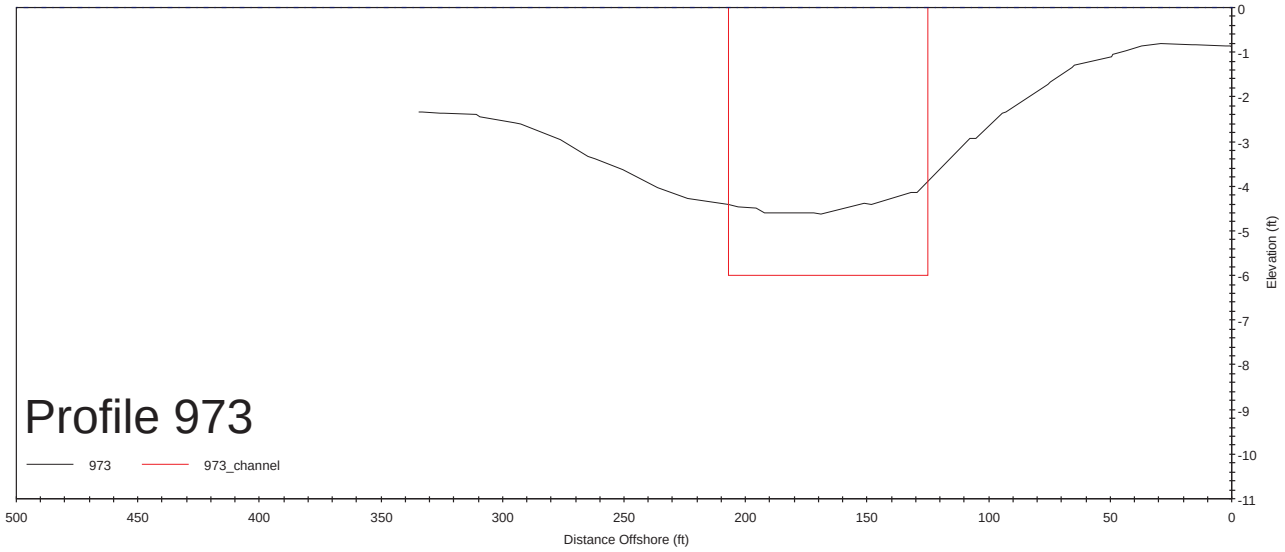


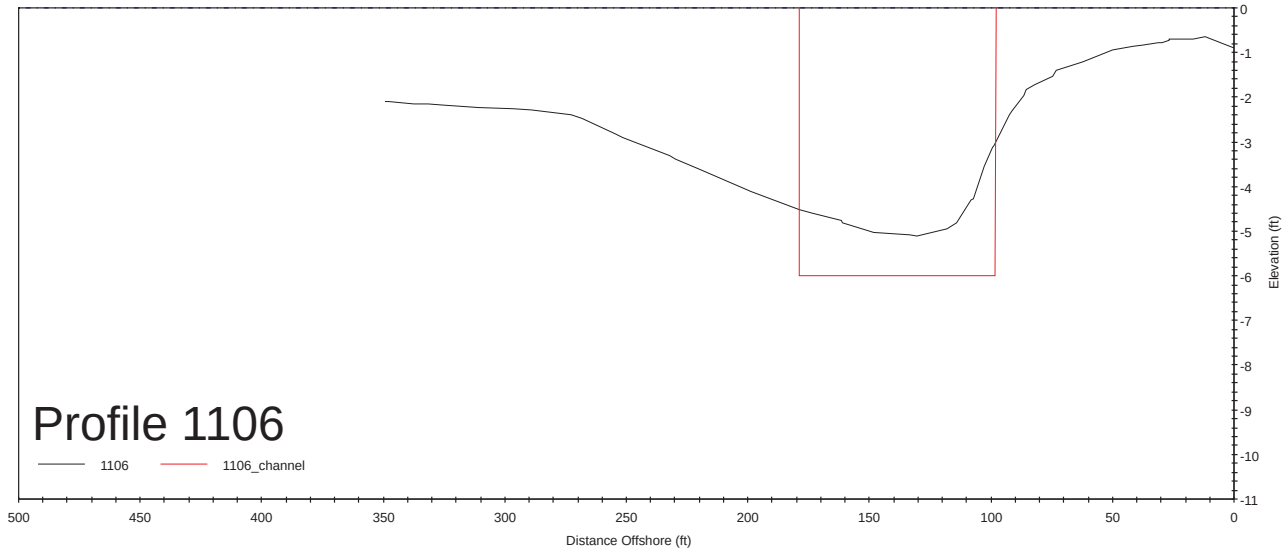


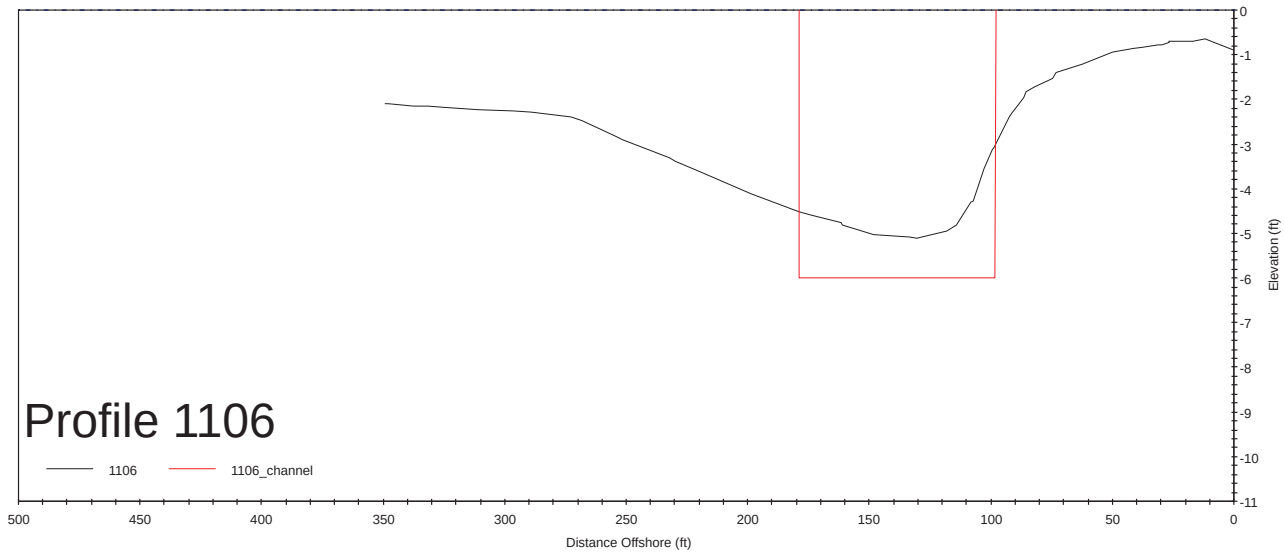


Aberdeen Creek Channel, MLLW





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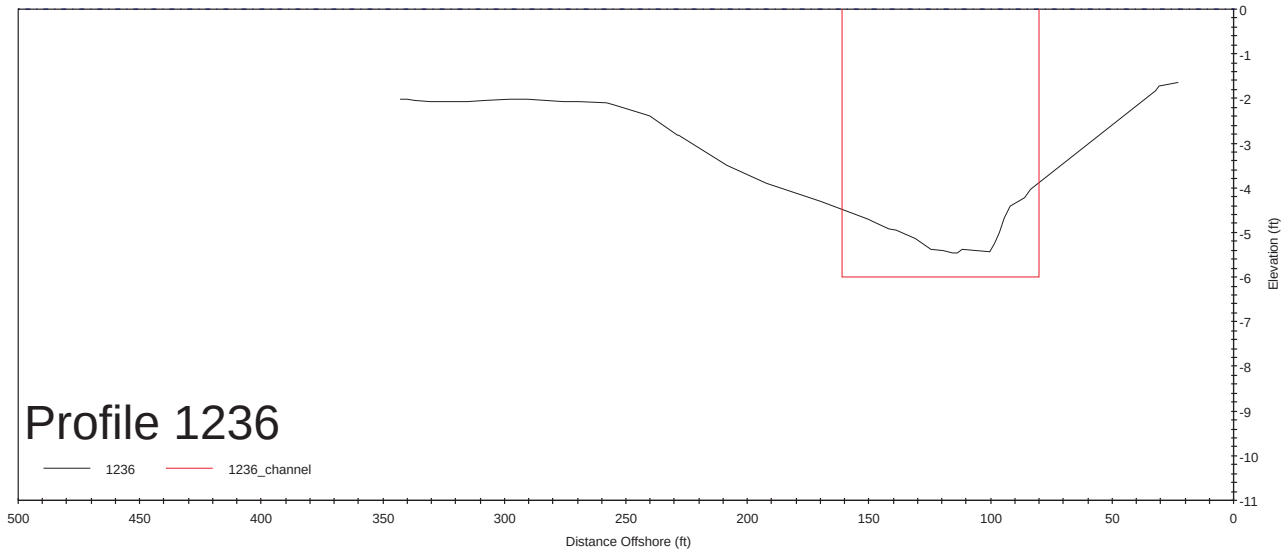
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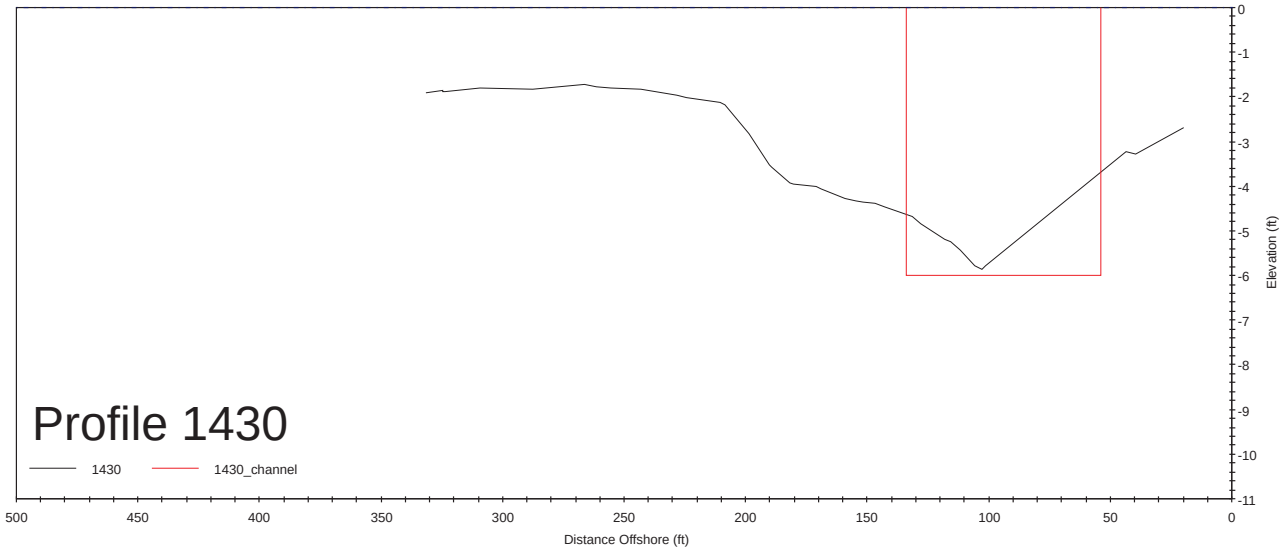
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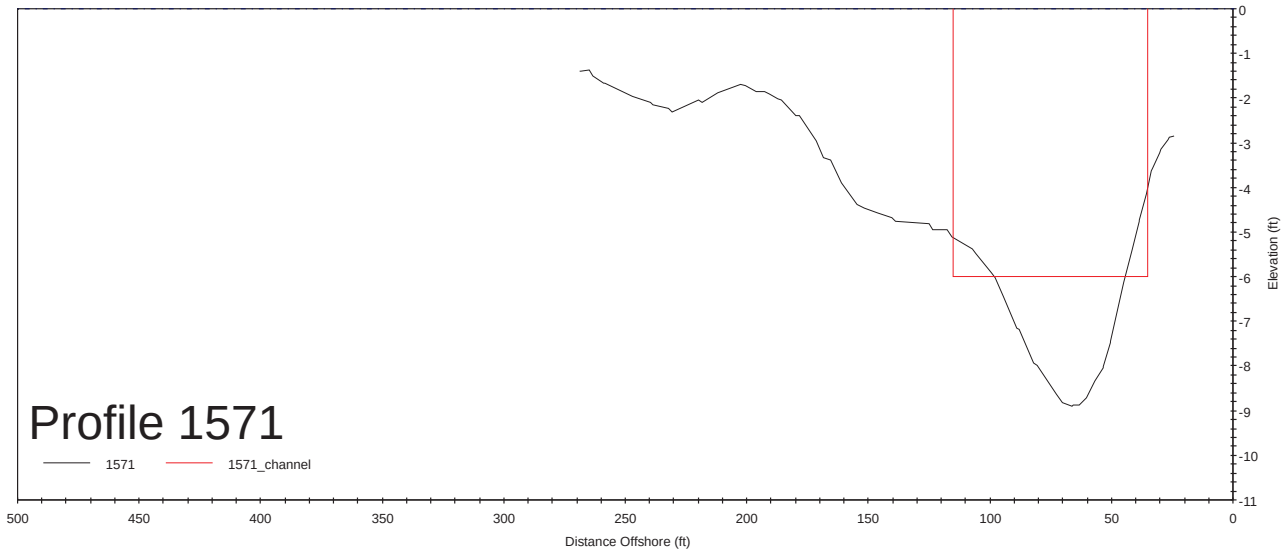
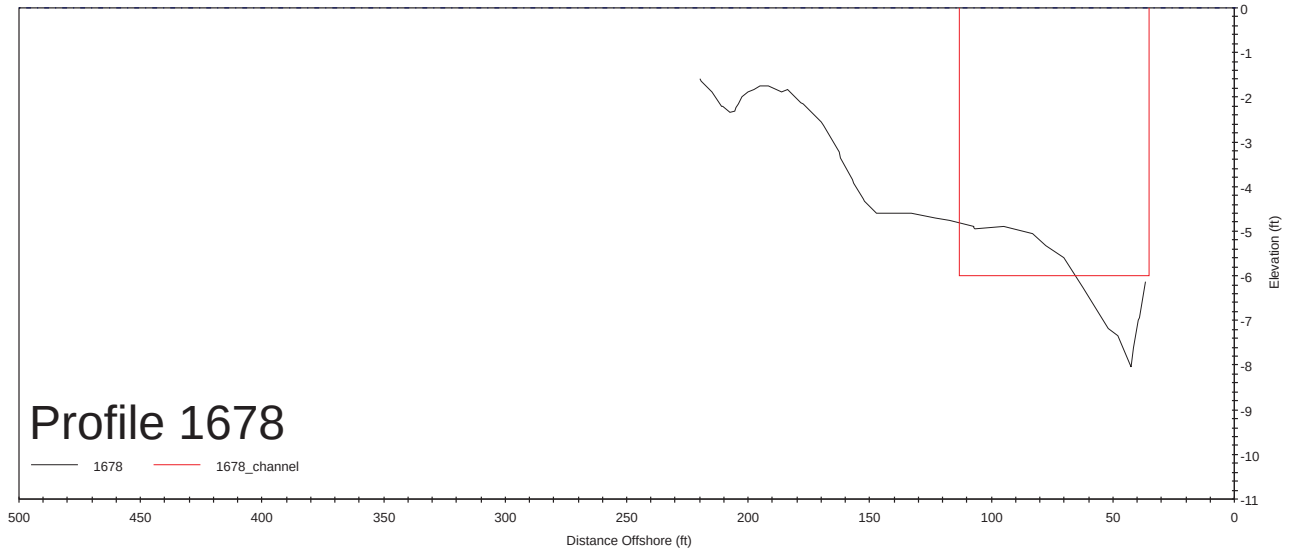
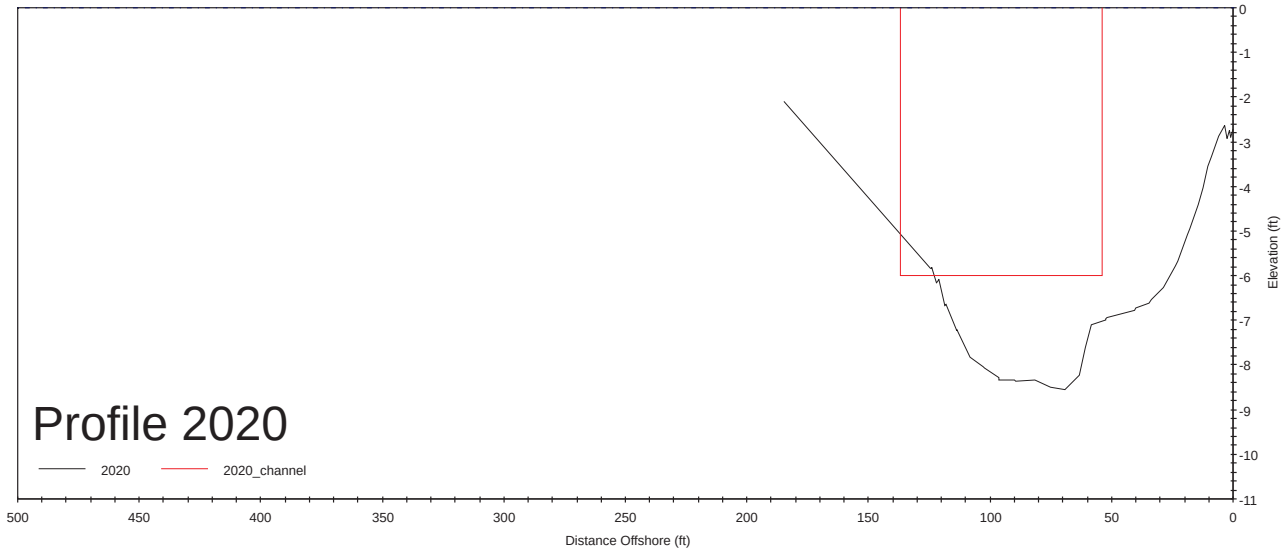
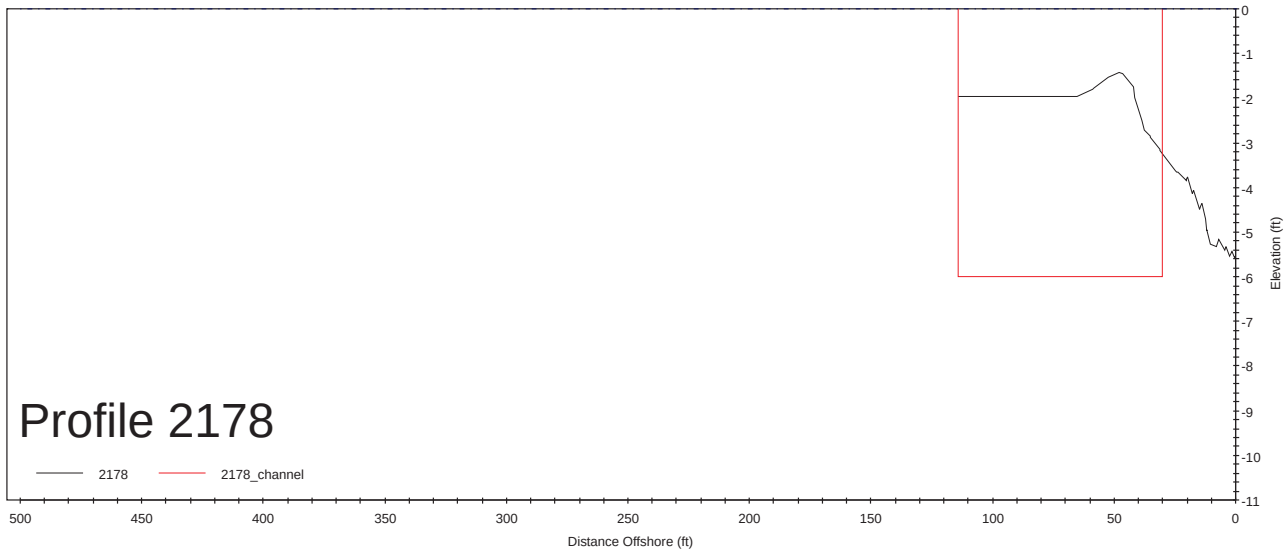
Aberdeen Creek Channel, MLLW





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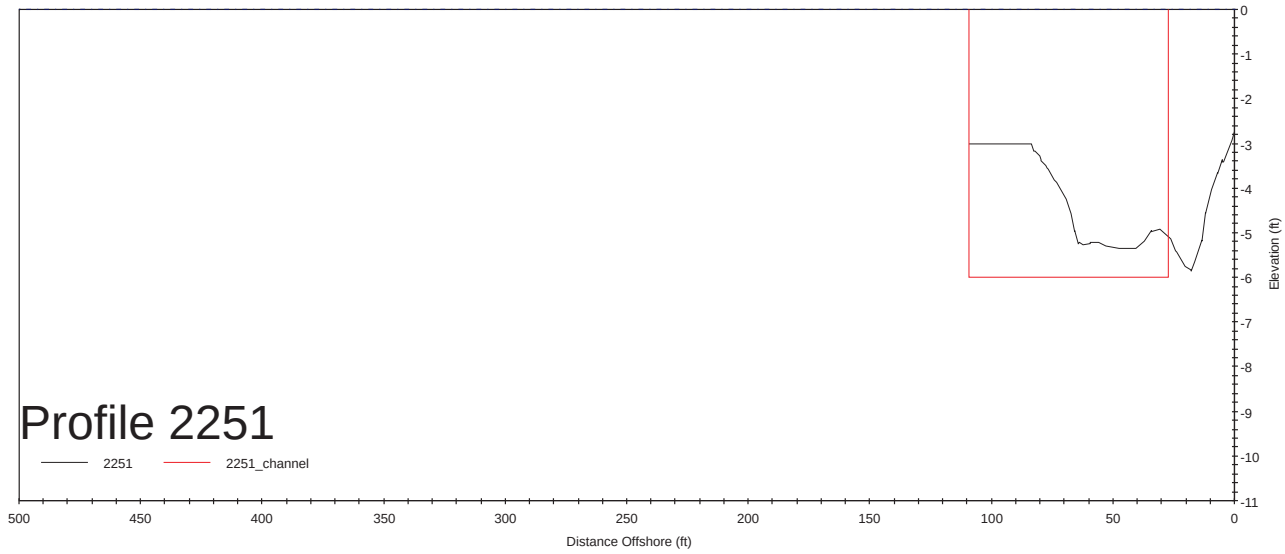
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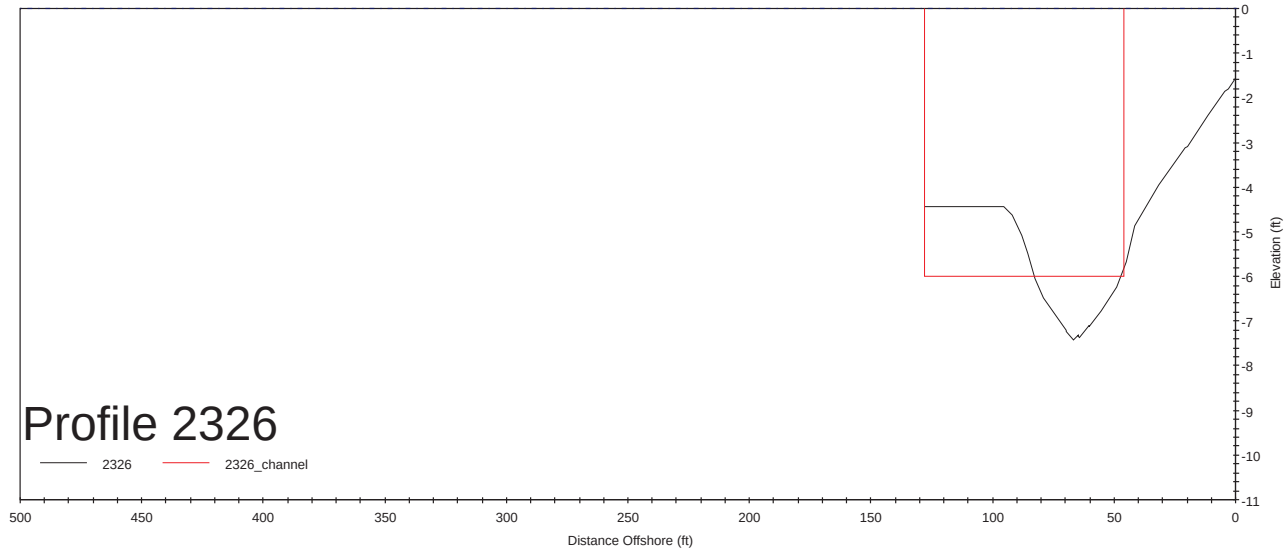
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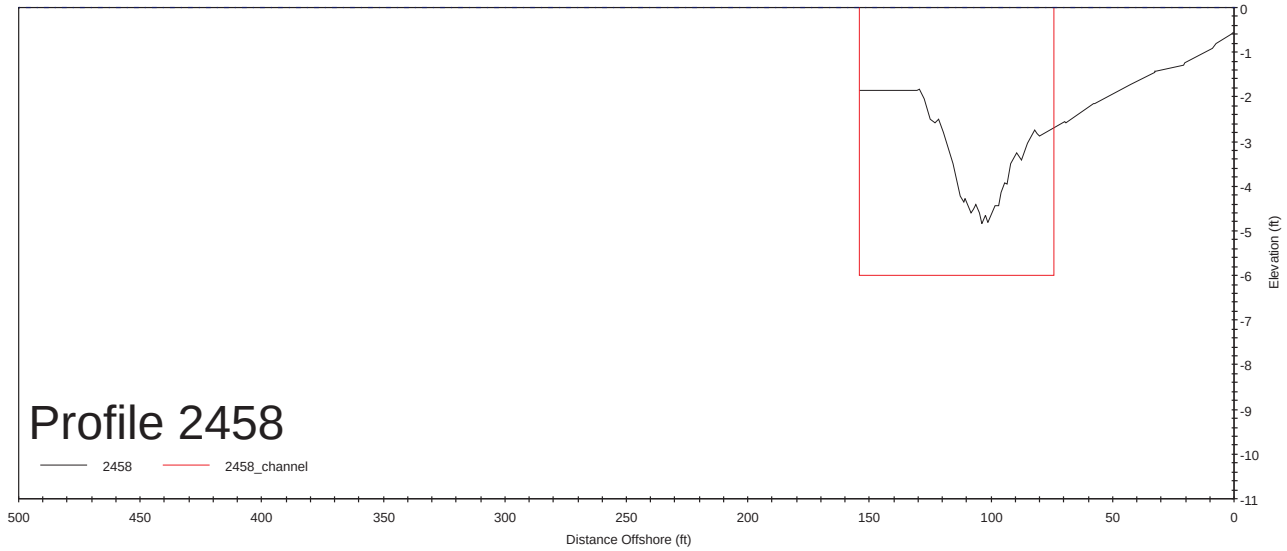
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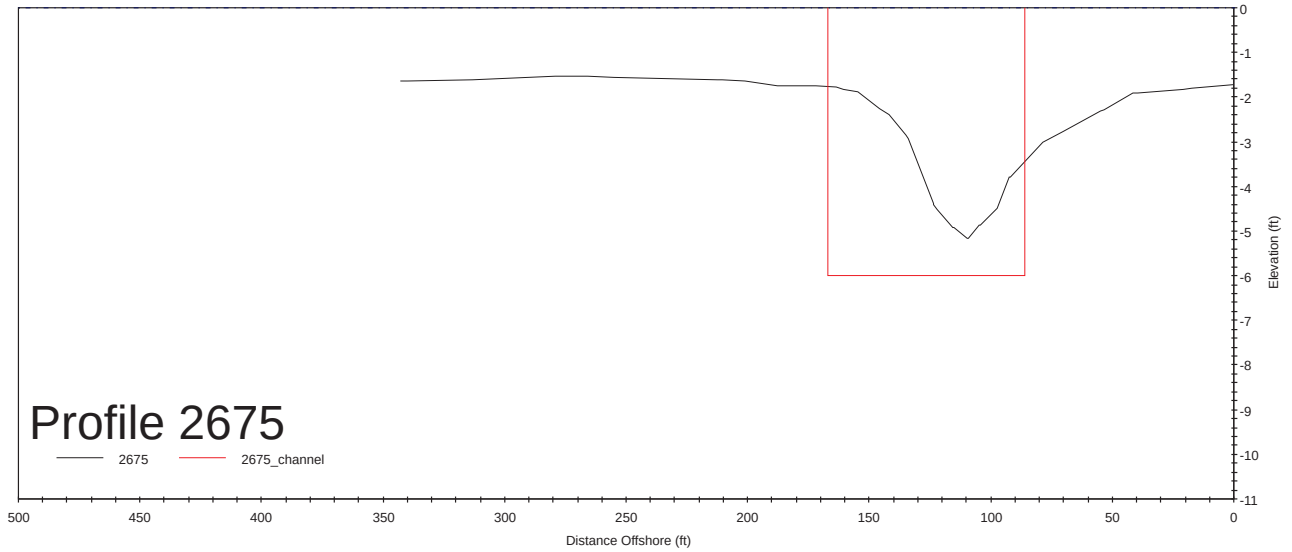
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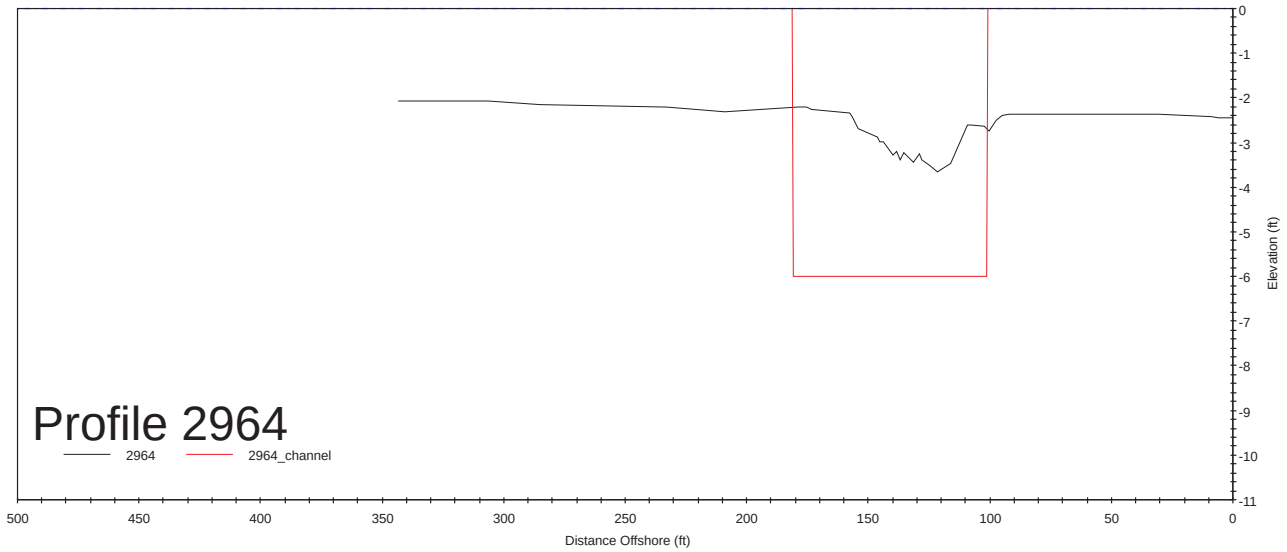
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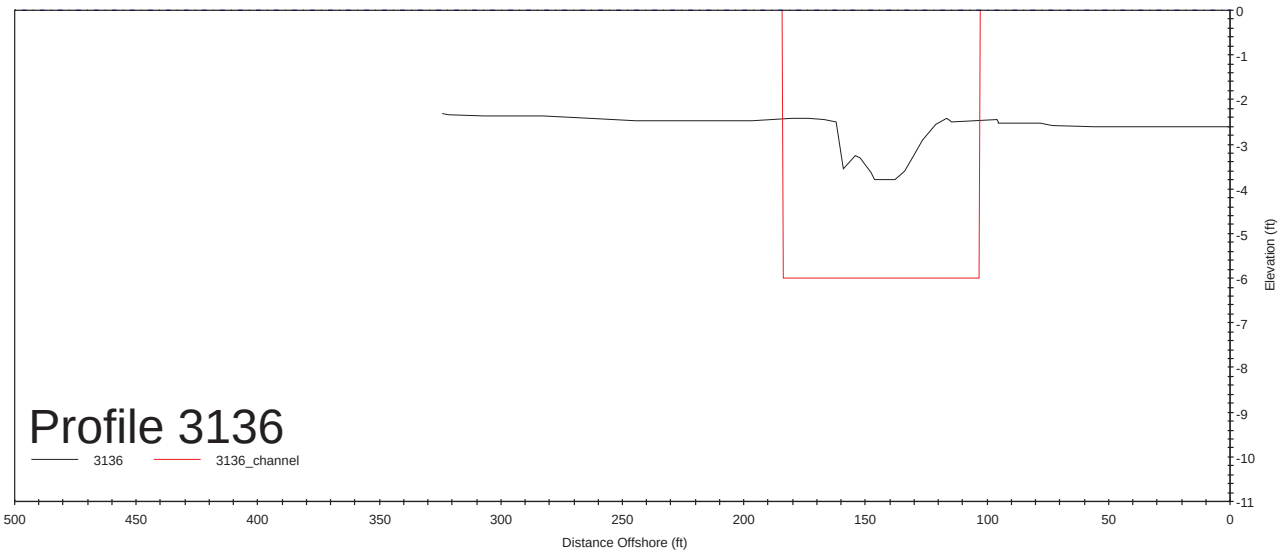
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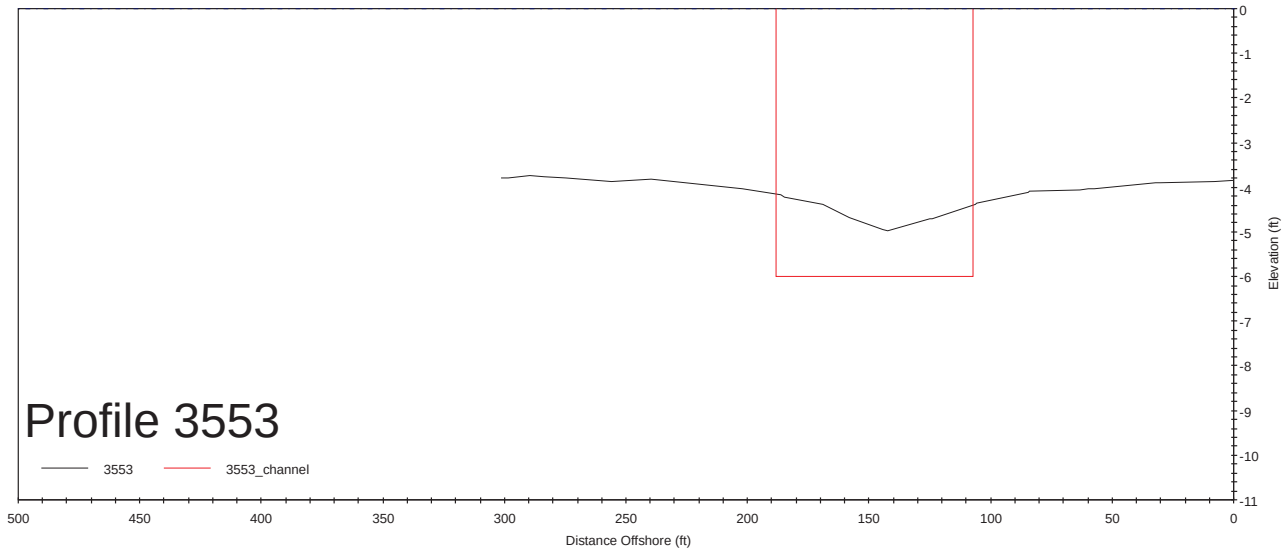
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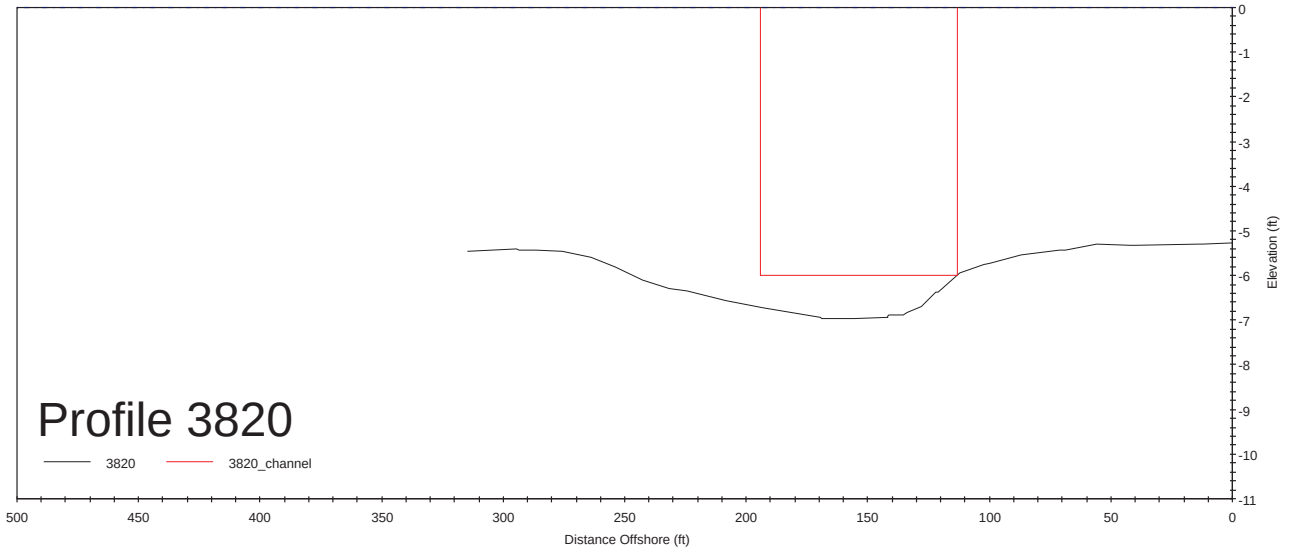
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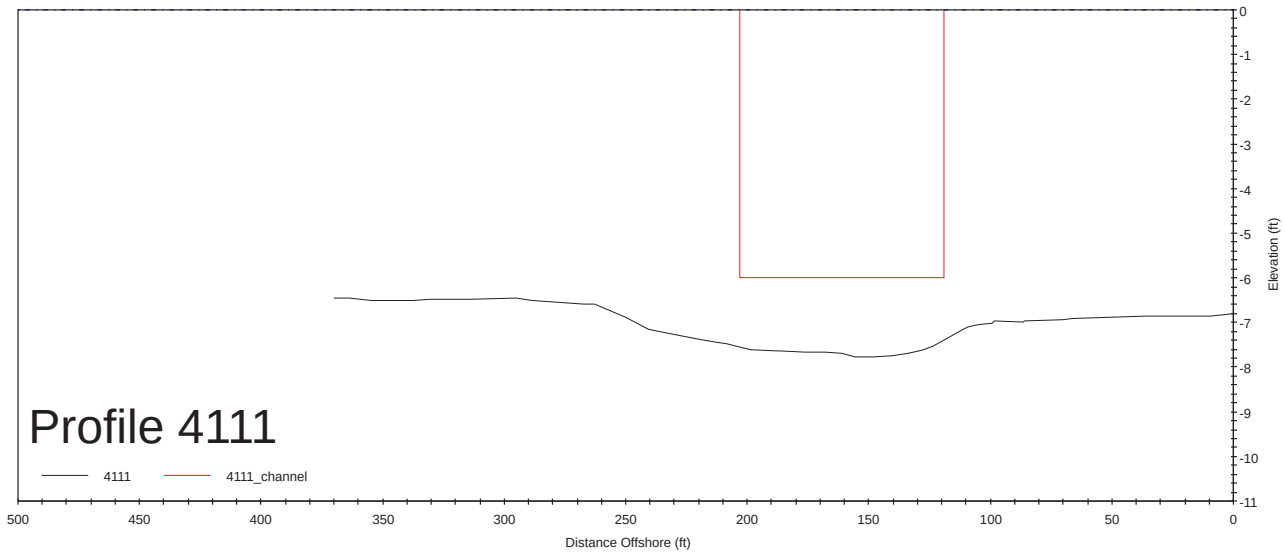
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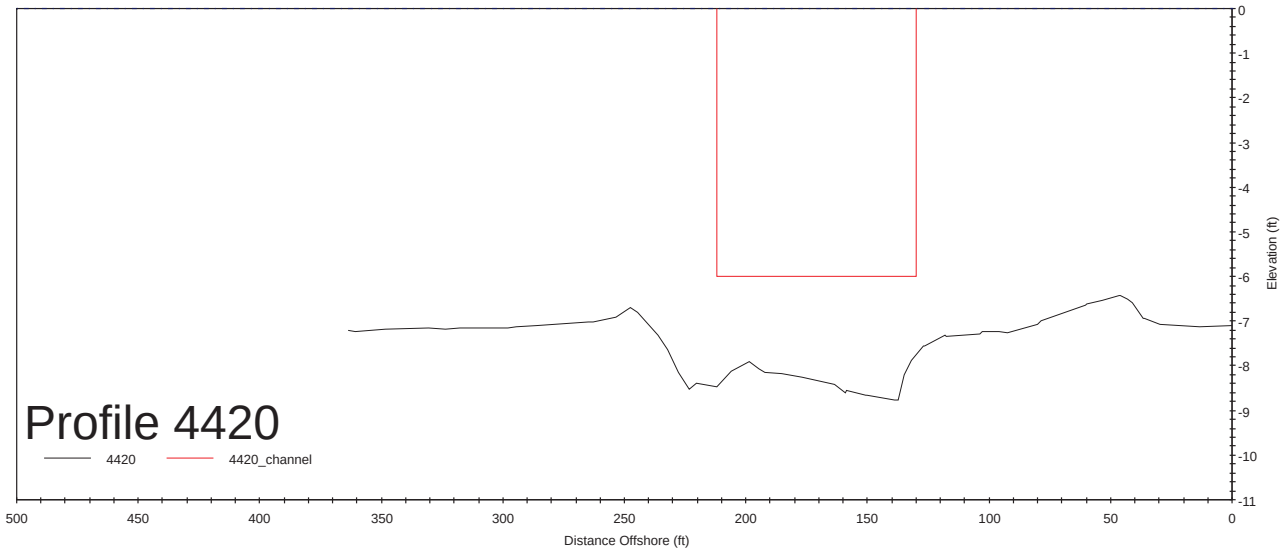
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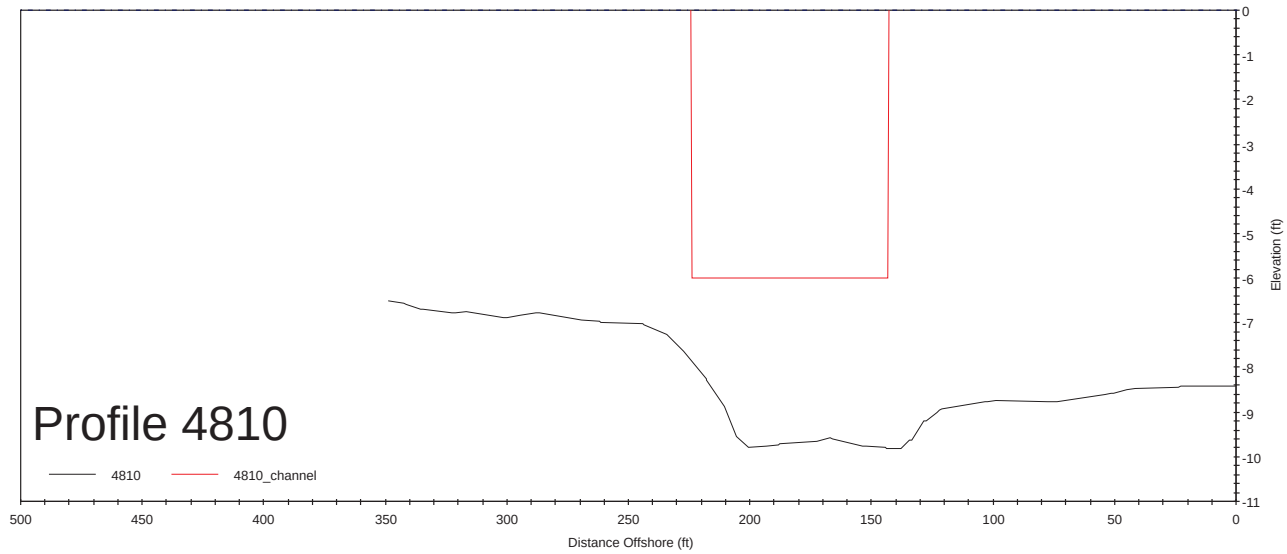
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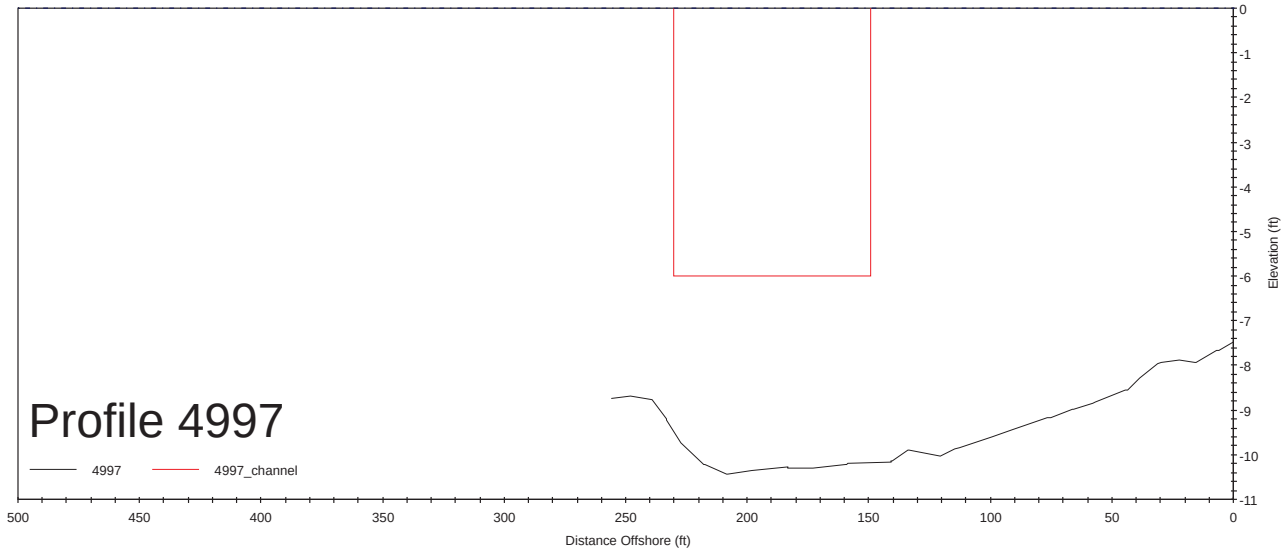
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200
150
100
50
0
Distance Offshore (ft)

Aberdeen Creek TIF Analysis

Using Tax Increment Financing to Finance Dredging of Aberdeen Creek

When considering a dredging project, it is necessary to look at the project's timeline and cost. The Middle Peninsula Planning District Commission partnered with the Middle Peninsula Chesapeake Bay Public Access Authority to determine three cost scenarios for the dredging of Aberdeen Creek, which are expressed in Table 1 below. These cost estimates were used as the estimates for the three TIF District scenarios in the feasibility study.

Table 1-Cost Scenarios for Three TIF Districts

Cost Scenario	Estimated Most Probable Dredging Cycle (years)	Estimated Most Probable Average Annual Cost	Estimated Total Cost
Low-Bound Annual Cost	16	$38,000	$608,000
Most Probable Annual Cost	8	$93,000	$744,000
High-Bound Annual Cost	4	$398,000	$1,592,000

Cost Scenario Definition: Table 1 provides three cost scenarios for the dredging of Aberdeen Creek: the Low-Bound Annual Cost, the Most Probable Annual Cost, and the High Bound Annual Cost. The cost of dredging the creek depends on the individual costs of a number of different components. Each of the three costs presented in Table 1 represent the average annual cost of dredging based on having high, average, or low individual component cost. For example, the Low-Bound Annual Cost represents the projected cost of dredging the creek given that the average cost of individual cost components is low. Three examples of individual cost components are listed below.

Dimensions of the Project

The size of the dredging project influences the cost of the project, with larger projects costing more. The authorized dimensions for the Aberdeen Creek dredging project is 5,280 ft. long, 80 feet wide, and 6 ft. deep for the creek's channel and 450 ft. long 400 ft. wide, and 6 feet deep for the creek's turning basin.

Sediment Disposal

Once a channel is identified as having a dredging need, a disposal site location must be selected. The disposal site should be prepared to receive and permanently contain the dredged material. The cost of disposing dredged material depends on the location of the disposal site. For example, sandy dredged material deposited on public beaches costs $0.05 per square foot, which is the encroachment fee charged by the Virginia Marine Resources Commission to private dredging projects. Since the dredging of Aberdeen Creek will be funded by Gloucester County, the Middle Peninsula State Park could possibly serve as the containment site for dredged material. By this being a local government project, it is exempt from dredging fees and royalties.

Permit Fees:

Permit fees contribute to the cost of dredging projects. The number of permits depends on the requirements of the projects, meaning Gloucester County could be required to obtain permitting from the following groups:

- The Virginia Marine Resources Commission ($100 permit fee for projects exceeding the cost of $10,000)
- The Virginia Department of Environmental Quality (Depending on permit requirements)
- The US Army Corp of Engineers (individual permits may cost up to $100)

Dredging Cycle Defined:

Dredging Aberdeen Creek is a long- term commitment. Shoaling, or sediment build up in a waterway's riverbed, is a natural process that over time makes a waterway shallow and impassable. Dredging is required in cycles to prevent this from happening. Within this report, the median number of years that pass between the dredging of a waterway is referred to as the median dredging cycle. The three projections in Table 1 are based on projected rate of shoaling, with the Low-Bound Dredging Cycle representing the slowest rate of shoaling, the Probable Dredging Cycle representing a medium dredging rate, and the High-Bound Dredging Cycle representing the fastest rate of shoaling.

Feasibility Study Description

The purpose of the feasibility study is to determine the timeline for dredging Aberdeen Creek using funds solely from an established TIF district. The study includes three potential TIF districts within Gloucester County and projects the revenue generated from each one. The study then factors in the cost of dredging to determine in what year the funds from the TIF district could pay for the dredging of Aberdeen Creek. The project methodology of the TIF Financed Aberdeen Creek Dredging Project is detailed in the next section.

Feasibility Study Methodology

Step One: Determine project cost

The first step in the feasibility study was determining the cost of the TIF project. The Middle Peninsula Planning District Commission partnered with the Middle Peninsula Chesapeake Bay Public Access Authority to determine three cost scenarios for the dredging of Aberdeen Creek, which are expressed in Table 2 below. These cost estimates were used as the estimates for the three TIF District scenarios in the feasibility study.

Table 2-Cost Scenarios for Three TIF Districts

Cost Scenario	Estimated Most Probable Dredging Cycle (years)	Estimated Most Probable Average Annual Cost ($)	Estimated Total Cost ($)
Low-Bound Annual Cost	16	38,000	608,000
Most Probable Annual Cost	8	93,000	744,000
High-Bound Annual Cost	4	398,000	1,592,000

Step Two: Determine project-financing options

The second step in the feasibility study was determining how Gloucester County would finance the TIF project. Traditionally, a municipality will either a) issue bonds to finance the cost of the project upfront and then use annual tax increments to pay off the bonds plus interest or b) finance the cost of the project on a "pay as you go" basis in which annual tax increments from the district goes directly towards paying for the cost of the project. Since Gloucester County leadership does not wish to incur debt in paying for the dredging of Aberdeen Creek, the feasibility study assumes that annual tax increments will accrue in a TIF fund that will then be used to pay for the cost of dredging over the life of the cycle outright on a 'pay as you go basis".

Step Three: Determine the economic impact of the project.

The third step in the feasibility study was determining the economic benefit of the completed TIF project. The economic benefit of dredging Aberdeen Creek is an increase in property values and tax revenue within the TIF district. These benefits were determined by a comparative analysis of waterfront home values on Aberdeen Creek, which revealed that houses with docks were worth 22.8% more than houses without docks, showing the added value navigable water access gives to waterfront property.[8] The feasibility study assumes that a fully shoaled Aberdeen Creek will negate the added value of docks for waterfront homes, thus lowering home values and tax revenue for the County.

Step Four- Determine the size of the TIF District

The fourth step in the feasibility study was determining the size of the TIF district. Traditionally, a TIF district is comprised of the properties that directly benefit from the TIF project. The feasibility study examined three potential TIF districts for the dredging of Aberdeen Creek.

A. *TIF District #1* consists of 40 properties, each of which directly front Aberdeen Creek. The majority of these properties are single-family homes with private docks granting access to the creek. These

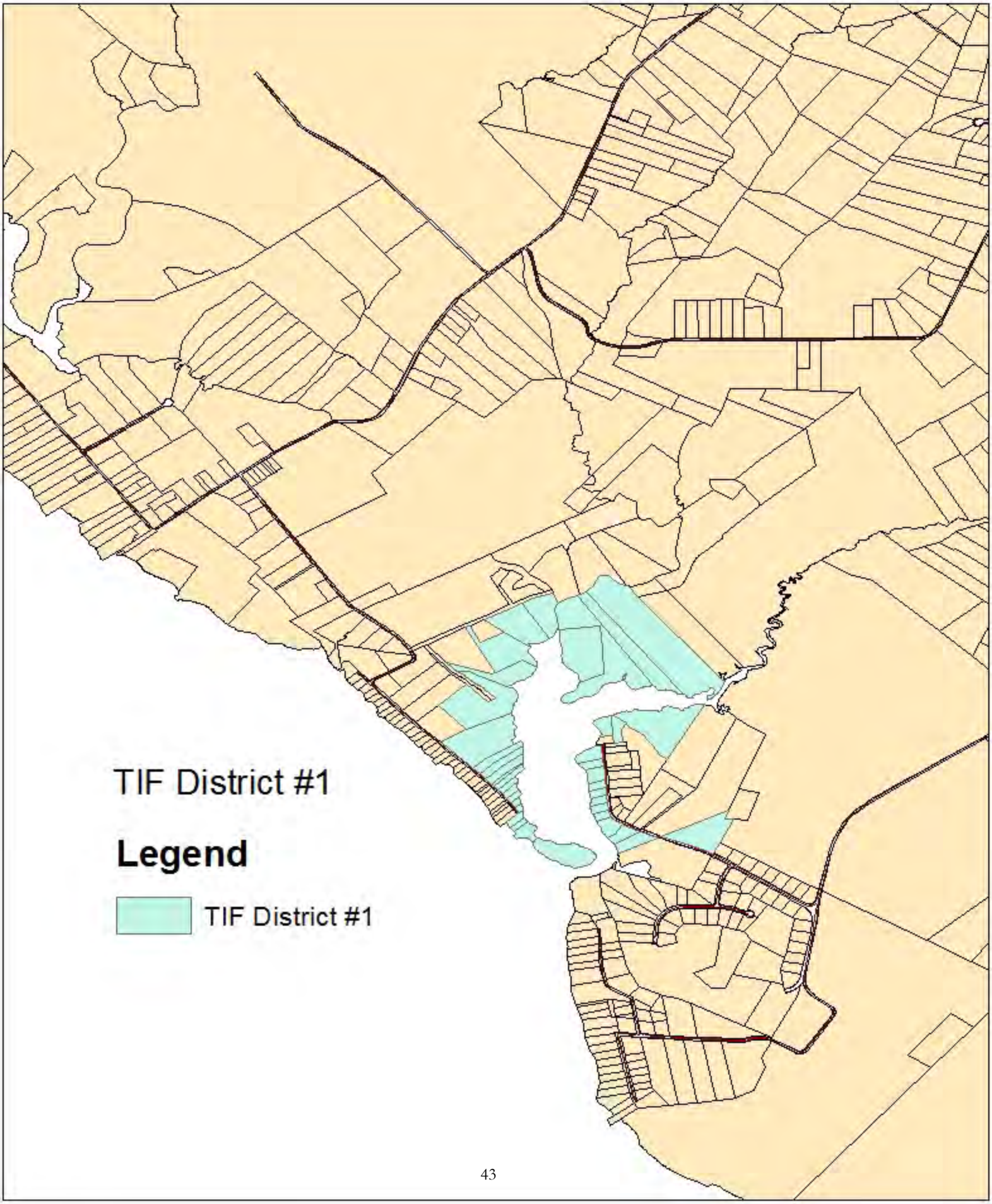
[8]The study found that waterfront homes on Aberdeen Creek with docks have an average assessed value per square ft. of $98.67 compared to waterfront homes on Aberdeen Creek without docks, which have an average assessed value of $80.30 per square ft.

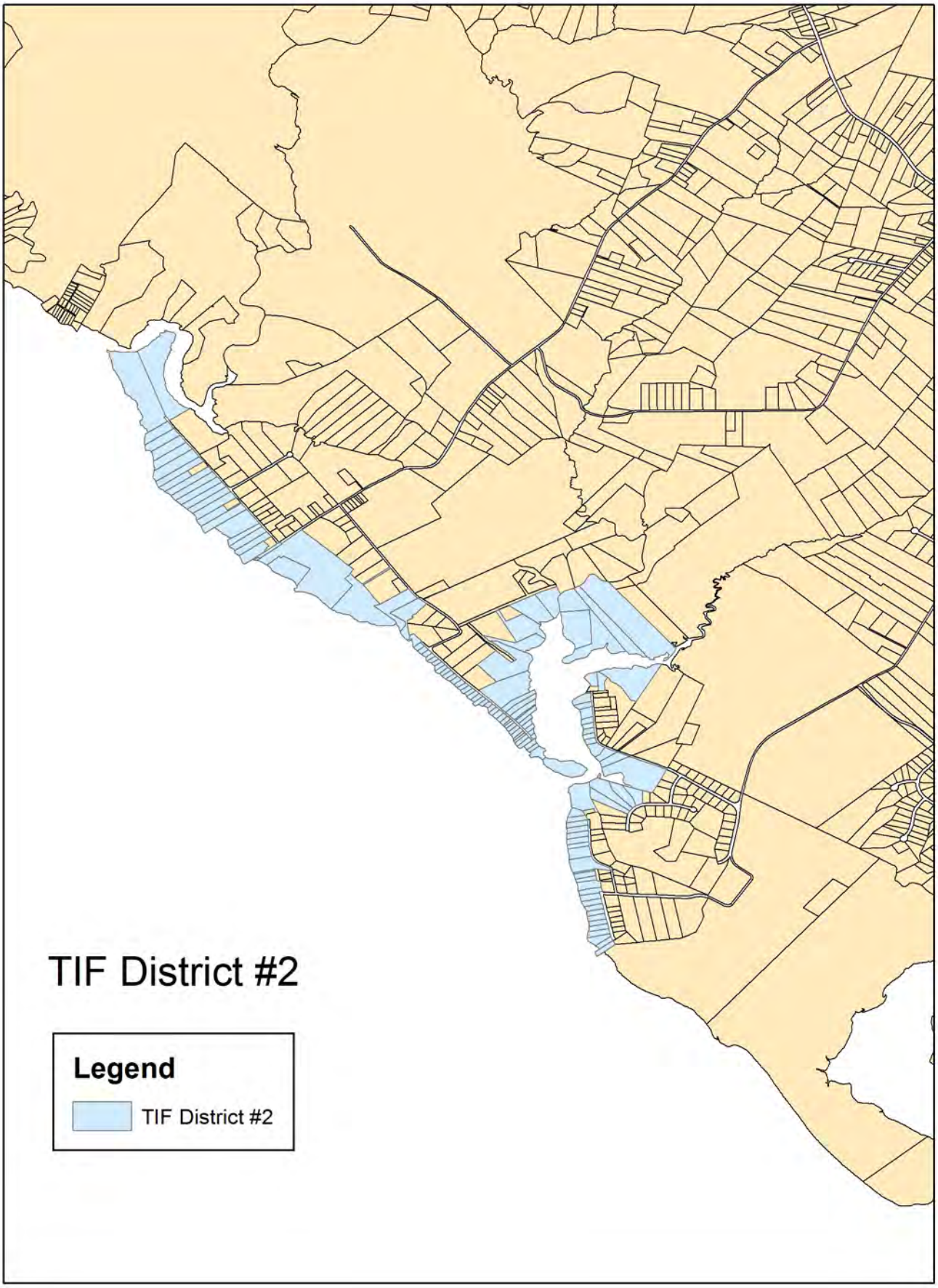
waterfront properties directly benefit from the dredging of Aberdeen Creek, as navigable water access is positively correlated with an increase in home values.

B. *TIF District #2* consists of 131 properties, the majority of which are waterfront homes that front either Aberdeen Creek or the York River. The dredging of Aberdeen Creek directly benefits the properties fronting the creek through increased home values and benefits all properties in the district by providing a "hurricane hole" for homeowners with boats.

C. *TIF District #3* consists of 619 properties, including the properties fronting Aberdeen Creek. The majority of properties in TIF District #3 are located east of Aberdeen Creek and include single family homes and as well as farmland. The dredging of Aberdeen Creek directly benefits the properties fronting the creek through increased home values, but provides no direct benefit to the remaining properties in the district.

Maps of TIF Districts #1, #2 and #3


TIF District #1
Legend
TIF District #1


TIF District #2
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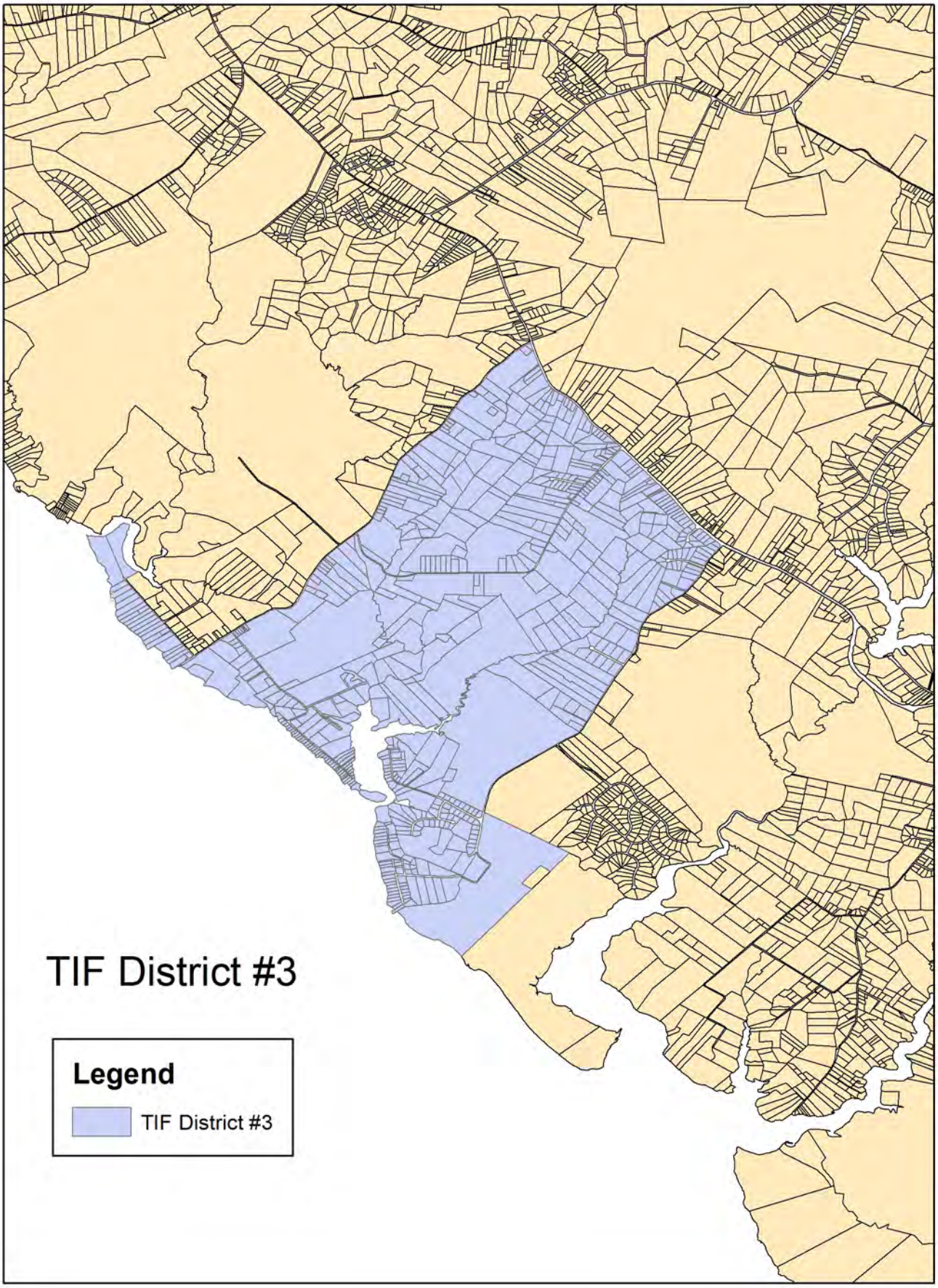
TIF District #2


TIF District #3
Legend
TIF District #3

Step Five- Determine the Base Total Assessed Value (BTAV) for each TIF District.

The fifth step in the feasibility study was determining the Base Total Assessed Value (BTAV) for each TIF district. The BTAV was determined by summing the current assessed value of each parcel included in the TIF District.[9] The BTAV of each TIF District is presented in Table 3.

Table 3-Base Total Assessed Value of TIF district ($)

TIF District # 1	TIF District #2	TIF District #3
7,455,600	34,955,100	104,122,300

Step Six- Determine the Base Value of Tax Revenue of Each TIF District.

The sixth step in the feasibility study was determining the base value of tax revenue for each TIF district. The base value of tax revenue is the total amount of property tax collected from the TIF district in its base year. The base value of tax revenue was determined by dividing the BTAV of the district by 100 and then multiplying this value by 0.65, since the Gloucester County Real Estate Tax rate is $0.65 per $100 of assessed value.[10] The base value of tax revenue for each TIF district is presented in Table 4.

Table 4-Base Value of Tax Revenue for each TIF District ($)

TIF District	Base Total Assessed Value	Gloucester County Real Estate Tax Rate	Base Value of TIF District
TIF District #1	7,455,600	$0.65 per $100 of Assessed Value	48,461.40
TIF District #2	34,955,100	$0.65 per $100 of Assessed Value	227,208.15
TIF District #3	104,122,300	$0.65 per $100 of Assessed Value	676,794.95

Step Seven-Calculate the Projected Annual Increase in Property Values

The seventh step in the feasibility study was calculating the projected annual increase in property values for each of the TIF districts. The model assumes that properties within each of the TIF districts will increase at a fixed annual rate of 2.5%.

[9] The current assessed values for parcels in Gloucester County were taken from the Gloucester County Real Estate Assessment website.

Step Eight-Calculate the Total Assessed Value, Revenue Value, and Tax Increment Value for each year of the TIF district.

The eighth step in the feasibility study was calculating the Total Assessed Value, Revenue Value, and Tax Increment Value for each year of the life of the three TIF districts. To do this, the model increases the TAV of the TIF district by the projected growth rate of 2.5% for each year. The model then calculates the Revenue Value for each year by dividing the year's TAV by 100 and multiplying this value by 0.65, the real estate tax rate per $100 of assessed value. Finally, the model calculates the Tax Increment Value for each year by subtracting the TIF district's Base Total Assessed Value of revenue from the revenue value for that year. Table 5 shows these three calculations for year one of TIF District #1.

Table 5-Year One Calculation for TIF District #1

Year One Assessed Value of District	Year One Revenue	Year One Tax Increment Value
7,641,990	(7,641,990/100)*0.65= 49,672.94	49,672.94-48,461.40= 1,211.54

Step Nine-Calculate the value of the TIF fund for each year of the life of the district.

The ninth step in the feasibility study was calculating the value of the TIF fund for each year of the life of the three TIF districts. Using the data collected in Step 8, the model sums 100% of the Tax Increment Value collected from each year to determine the value of the TIF Fund at the end of each year. Table 6 shows the value of the TIF fund in the first five years for TIF District #2.

Table 6- TIF District #2 TIF Fund Value

Year	TIF Increment Value	Total Value of TIF Fund
1	5,680.20	5,680.20
2	11,502.41	17,182.62
3	17,470.18	34,652.79
4	23,587.13	58,239.93
5	29,857.02	58,239.93

Step Ten- For each of the three TIF districts; determine the year in which the TIF fund can begin paying outright for the projected cost of dredging without running out of funds for the life of the payment schedule.

The tenth and final step in the feasibility study was determining the year in which each TIF district, using money solely from the TIF fund, could begin paying outright for the projected cost of dredging without

running out of funds for the life of the payment schedule. The model uses the three cost estimates presented in Step 1. The model subtracts the projected annual cost of dredging for each year of the dredging cycle from the value of the TIF fund, which continues to receive each year's tax increment value. Therefore, the cost of dredging is paid for by money that has accumulated in the TIF fund and the tax increment value that comes in for each year of the dredging cycle. Table Seven shows this process for the High-Bound Annual Cost scenario of TIF District #3, which has an average annual cost of $398,000 and a payment cycle of 4 years.

Table Seven-TIF District #3 High-Bound Annual Cost Scenario

Year	TIF Increment	Total Value of Slush Fund	TIF Fund Value After One Year Dredging Cost	TIF Fund Value After Two Year Dredging Cost	TIF Fund Value After Three Year Dredging Cost	TIF Fund After Four Year Dredging Cost
7	127,701.57	498,199.52	100,199.52	-149.986.50	-379,557.30	-587,997.49
8	147,813.98	646,013.50	248,013.50	18,442.70	-189,997.49	-376,778.82
9	168,429.20	814,442.70	416,442.70	208,002.51	21,221.18	-143,359.80
10	189,559.81	1,004,002.5	606,002.51	419,221.18	254,640.20	112,814.56

As seen in Table Seven, Year 10 is the year in which Gloucester County could begin to fully fund the High-Bound Cost of dredging Aberdeen Creek using money solely from the TIF fund for the life of the payment schedule. This year is referred to as First Year of Payment in the report.

Feasibility Report Findings

TIF District #1:

TIF District #1 is the smallest of the three TIF districts, consisting of 40 parcels of waterfront property fronting Aberdeen Creek with a Base Total Assessed Value of $7,455,600. Table Eight shows the First Year of Payment for each of the three cost scenarios in TIF District #1.

Table Eight-First Year of Payment For TIF District #1

Cost Scenario	Estimated Most Probable Dredging Cycle (years)	Estimated Most Probable Average Annual Cost	First Year of Payment
Low-Bound Annual Cost	16	$38,000	Year 14 of TIF Fund
Most Probable Annual Cost	8	$93,000	Year 24 of TIF Fund
High-Bound Annual Cost	4	$398,000	Year 40 of TIF Fund

As seen in Table Eight, Gloucester County can begin paying for the most probable cost of dredging Aberdeen Creek 24 years into the life of TIF District #1, meaning the creek dredging process will not be complete until 32 years after the creation of the TIF District. TIF District #1 has the longest timeframe for each of the three cost scenarios tested within the feasibility study.

TIF District # 2:

TIF District #2 is the second largest TIF district, consisting of 131 parcels of waterfront property on both Aberdeen Creek and the York River. The district has a BATV of $34,955,100. Table Nine shows the First Year of Payment for each of the three cost scenarios in TIF District #2.

Table Nine-First Year of Payment For District #2

Cost Scenario	Estimated Most Probable Dredging Cycle (years)	Estimated Most Probable Average Annual Cost	First Year of Payment
Low-Bound Annual Cost	16	$38,000	Year 4 of TIF Fund
Most Probable Annual Cost	8	$93,000	Year 8 of TIF Fund
High-Bound Annual Cost	4	$398,000	Year 19 of TIF Fund

As seen in Table Nine, Gloucester County can begin paying for the most probable cost of dredging Aberdeen Creek 8 years into the life of TIF District #1, meaning the creek dredging process will not be complete until 16 years after the creation of the TIF District. TIF District #2 has the second longest timeframe for each of the three cost scenarios tested within the feasibility study.

TIF District # 3:

TIF District #3 is the largest of the three districts, consisting of 619 parcels that span from waterfront property on Aberdeen Creek to Hickory Rd. TIF District #3 has a BATV of $104,122,300, which is the highest of the three districts. Table Ten shows the First Year of Payment for each of the cost scenarios

Table Ten-First Year of Payment For District #2

Cost Scenario	Estimated Probable Dredging Cycle (years)	Estimated Probable Average Annual Cost	First Year of Payment
Low-Bound Annual Cost	16	$38,000	Year 2 of TIF Fund
Most Probable Annual Cost	8	$93,000	Year 4 of TIF Fund
High-Bound Annual Cost	4	$398,000	Year 10 of TIF Fund

As seen in Table Ten, Gloucester County can begin paying for the most-probable cost of dredging Aberdeen Creek 4 years into the life of TIF District #1, meaning the creek dredging process will not be complete until 12 years after the creation of the TIF District. TIF District #3 has the shortest timeframe for each of the three cost scenarios tested within the feasibility study.

Recommendations

TIF District Selection:

It is recommended that Gloucester County implement the TIF district that matches the desired timeline for completion of the project. As of the writing of this report, commercial fishermen have stated that portions of Aberdeen Creek are problematic to navigate due to shoaling. Once the extent of shoaling of Aberdeen Creek becomes clear, the County can decide which TIF district will addresses the problem in an appropriate timeframe.

Permits for Commercial Docking:

It is recommended that Gloucester County fund a professional assessment of the annual cost of maintaining the public boat landing on Aberdeen Creek. After determining the annual cost of maintaining the public boat landing, it is recommended that Gloucester County require commercial fisherman to purchase permits in order to use the public landing. The revenue raised through permit sales will be used for the maintenance of the public landing.

Appendix 2

Aberdeen Creek Dredging Project – Restarting an Economic Engine

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Aberdeen Creek Dredging Project – Restarting an Economic Engine

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Virginia Institute of Marine Science
Virginia Sea Grant-Affiliated Extension

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Cover Photo: Overhead aerial view from Google Earth.

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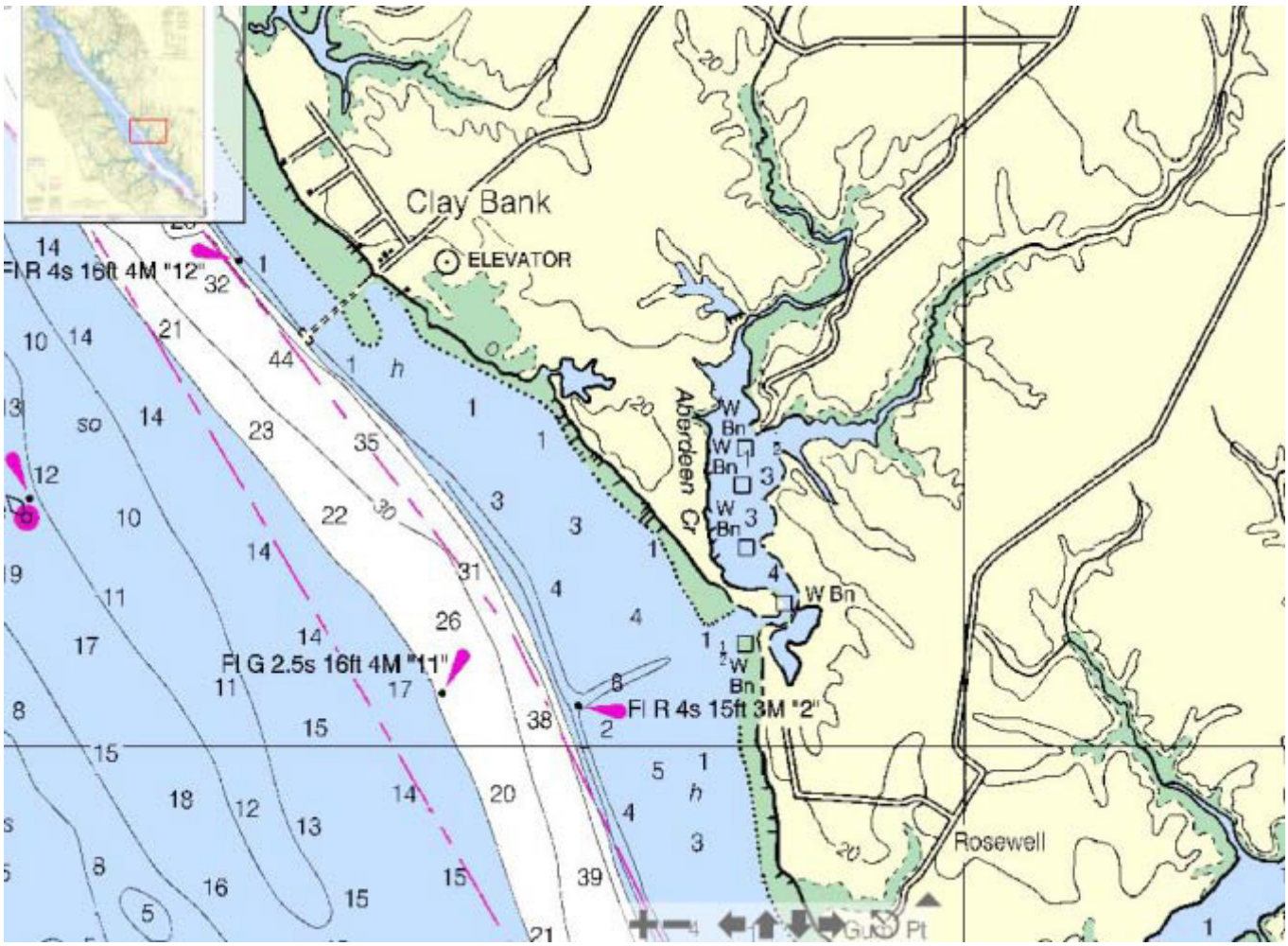
Overview and Purpose of the Study

This study was performed to illustrate and quantify how much working waterfronts in this case, a small waterway serving seafood unloading and processing facility, contribute to the local and regional economy. Gloucester commercial workboats returning from harvesting trips face an often difficult navigation of Aberdeen Creek to unload at what once was the Gloucester Seafoods– a significant landing and processing facility. Aberdeen Creek is a classic example of a working waterway representing a critical nexus between the marine fisheries and the community; providing one of the few remaining commercial fishing unloading points in Gloucester. In view of this, the facilities economic place in the community once unique, may again be fiscally important.

This study estimates the economic impact (i.e., expenditures, economic output, incomes, and jobs) of Aberdeen Creek's commercial fisheries landings, processing/packing industry to the local economy. Gloucester's commercial fisheries industry has historically represented an important component of the Commonwealth's commercial seafood industry. The off-loading of fishery products at the Gloucester landing facility sets in motion a number of economic activities that results in the sale of fresh and frozen value-added seafood products outside of Gloucester. These economic activities include spending and re-spending of dollars, which creates incomes and jobs within several associated industries and markets. The amount of economic activity associated with the Gloucester landings is directly related to the volume of seafood off-loaded into the local processing facilities. The volume harvested is determined by the number of watermen unloading at the facility which is also determined by a number of factors such as availability of competitive unloading facilities, stock abundance and fishing effort, which are in turn affected by environmental conditions in the regions, short-term weather conditions, and the general market for seafood specific fishery products such as flounder.



Methodology

Collecting the Necessary Data

In order to understand the linkages with related industry sectors associated with off-loading, processing and packing seafood in Gloucester, interviews were conducted with the owners of seafood facilities in Gloucester and the middle peninsula who have recently begun to use Aberdeen Creek as an loading and unloading point primarily for hard crabs and oyster production.

Economic Impact Estimation

The fishery landing information collected is utilized in estimating the beginning economic activities in the Gloucester Economy. These economic activities take the form of initial expenditures, economic output, wages and salaries, and employment.

Values for each of these are estimated by employing the IMPLAN model, a computer software and database package designed for regional economic impact analysis in the United States at the county level (Minnesota Implan Group, Inc., 1997). The analytical framework for IMPLAN is the "input-output" economic modeling approach originally described by Leontief (1959). The model utilizes databases consisting of a set of social/economic accounts which describe the structure of the US economy in terms of transactions between households, governments, and over 500 standardized industry sectors classified on the basis of the primary commodity or service produced.

Regional models may be constructed in IMPLAN for any county, group of counties, or state or territory in the United States. Economic impacts and activities for a given region are specified in IMPLAN as a change in final demand, output, or employment for a particular industry sector or social institution (e.g., households, government). The aggregate economic impact of these changes is calculated by a matrix inversion procedure that develops economic multipliers, which reflect the direct, indirect and induced impacts. Direct, indirect, and induced impacts are set in motion within Gloucester County by changes in the supply and demand of raw seafood, which in turn affects the demand for the goods and services associated with producing raw seafood.

Gloucester Seafood

The commercial seafood industry in Gloucester and the Middle Peninsula represents a "basic" industry e.g. producing a product for sale outside the local area. Dollars generated through these out-of-county sales (or consumption locally by non-residents), when re-spent in the community, produce additional countywide economic impacts. A "basic" industry directly affects economic activity in the region when its product is sold outside the local area. For the commercial seafood industry in Gloucester, this would include sales, jobs, and earnings generated in commercial fishing and other activities related to the preparation of the seafood for shipping to market. These direct activities produce additional indirect effects in the local economy as dollars earned through the sale of seafood are re-spent locally. Indirect effects represent purchases of local products by seafood vessels, such as ice, fuel, gear and net repair, groceries, etc. All the indirect effects are additional economic activity in the community and are indicative of additional jobs and income generated by the sale of seafood outside the community.

Direct and indirect activities associated with commercial seafood harvesting, processing and the sale of seafood outside Gloucester then produce additional (induced) local impacts. These impacts are associated with the spending of income earned in the direct and indirect activities. This spending translates into local retail sales, local bank deposits, and the purchase of a diverse mix of consumer goods. An assessment of the total economic impact of a basic industry, such as commercial seafood on Gloucester, must consider the sum of the direct, indirect, and induced activities. In essence, the sale of Gloucester landed fishery products outside the community triggers a chain of local spending, which generates income and leads to additional spending. This process, however, is not infinite in nature. At each round of spending, for example, some dollars are lost (leaked) from the local economy. Leakages are in the form of savings in non-local institutions, taxes/fees paid to the state and federal governments, and payments for goods and services used in the preparation of raw seafood for market, which are initially purchased outside the local area. Thus, the true economic impact from non-local sales of Gloucester-landed seafood is represented by the new dollars remaining after accounting for the various leaks in the "economic hull" of the Gloucester economy and the Gloucester seafood processing/packing industry.

Total economic activities and impacts to the Gloucester economy associated with off-loading seafood in Gloucester are estimated below (Table 1). The direct, indirect, and induced affects, in terms of economic output (sales of seafood), personal incomes, total value added (wholesale margin), and employment is estimated via the IMPLAN model. The estimates are from actual landings and financial information for 2012.

Harvest Only		Table 1. Aberdeen Creek Harvest Landed in Gloucester ($ Millions)							
		Baseline	Baseline + Increment Year 1	Baseline + Increment Year 2	Baseline + Increment Year 3	Baseline + Increment Year 4	Baseline + Increment Year 5	Baseline + Increment Year 6	Baseline + Increment Year 7
Labor Income Impacts	Direct Impacts	$0.75	$0.78	$0.82	$0.86	$0.90	$0.93	$0.97	$1.01
	Indirect Impacts	$0.07	$0.08	$0.08	$0.09	$0.09	$0.09	$0.10	$0.10
	Induced Impacts	$0.10	$0.10	$0.10	$0.11	$0.11	$0.12	$0.12	$0.13
	Total	$0.92	$0.96	$1.01	$1.05	$1.10	$1.15	$1.19	$1.24
Indirect Business Tax Impacts	Direct Impacts	$0.03	$0.03	$0.03	$0.03	$0.03	$0.03	$0.03	$0.04
	Indirect Impacts	$0.01	$0.01	$0.01	$0.01	$0.02	$0.02	$0.02	$0.02
	Induced Impacts	$0.03	$0.03	$0.03	$0.03	$0.03	$0.03	$0.04	$0.04
	Total	$0.07	$0.07	$0.07	$0.08	$0.08	$0.08	$0.09	$0.09
Other Property Income Impacts	Direct Impacts	$0.02	$0.02	$0.02	$0.03	$0.03	$0.03	$0.03	$0.03
	Indirect Impacts	$0.02	$0.02	$0.02	$0.02	$0.02	$0.03	$0.03	$0.03
	Induced Impacts	$0.09	$0.09	$0.09	$0.10	$0.10	$0.11	$0.11	$0.12
	Total	$0.13	$0.14	$0.14	$0.15	$0.15	$0.16	$0.17	$0.17
Total Value Added Impacts	Direct Impacts	$0.80	$0.83	$0.87	$0.91	$0.95	$0.99	$1.03	$1.07
	Indirect Impacts	$0.11	$0.11	$0.12	$0.12	$0.13	$0.14	$0.14	$0.15
	Induced Impacts	$0.21	$0.22	$0.23	$0.24	$0.25	$0.26	$0.27	$0.28
	Total	$1.11	$1.17	$1.22	$1.28	$1.33	$1.39	$1.45	$1.50
Output Impacts	Direct Impacts	$3.50	$3.68	$3.85	$4.03	$4.20	$4.38	$4.55	$4.73
	Indirect Impacts	$0.21	$0.22	$0.23	$0.24	$0.25	$0.26	$0.27	$0.28
	Induced Impacts	$0.35	$0.37	$0.38	$0.40	$0.42	$0.44	$0.45	$0.47
	Total	$4.05	$4.26	$4.46	$4.66	$4.87	$5.07	$5.27	$5.47
Employment Impacts (# Jobs)	Direct Impacts	99	104	109	114	119	124	129	134
	Indirect Impacts	2	2	2	2	2	2	2	3
	Induced Impacts	3	3	4	4	4	4	4	4
	Total	105	110	115	120	125	131	136	141

Results

Gloucester Industry / Economy Linkages

The economic linkages between the Gloucester seafood processing/packing industry and other sectors of the local economy were revealed in part through individual interviews and consultations with members of the local business community in Gloucester.

The economic activities associated with the seafood industry are set in motion by the landing of seafood raw seafood flows to the processors/packers as dockside revenues flow to the vessels. The raw seafood is then processed (gutted, graded, boxed, iced, etc.) by the processors/packers. To accomplish this task, however, supplies are purchased from local suppliers of goods and services, while labor is purchased from local households.

Some seafood is sold to local seafood distributors and retailers, but the majority is sold to wholesale firms outside of the region. The revenue generated by these "export" sales represents new dollars in the Gloucester economy are then spent again and again within the local economy as earnings by local households are used to purchase goods and services from other local businesses and seafood from local seafood dealers. In addition, dockside revenues initially paid to seafood vessels is used by crewmembers to purchase goods and services from both fishing-related suppliers and other local businesses. Some dockside revenues are used to purchase labor from local households as seafood vessel crewmembers. Some dockside revenues may also be retained in the local economy by vessel owners who reside in Gloucester households. Finally, some of this revenue is used to re-initiate the process by purchasing the next load of seafood that arrives at the dock.

Economic Impacts Associated with Gloucester Seafood Industry

The economic impacts associated with the seafood industry on Gloucester were estimated with IMPLAN. Estimates for only one set of annual assumptions for a given year or set of resource/market conditions may be significantly different in the following year.

Findings of the IMPLAN Economic Impact Analysis

The magnitude of the estimated economic impacts is directly related to landings volumes, dockside price, wholesale markup, and the export percentage. Thus, the actual economic impacts associated with the Gloucester seafood industry will vary from year to year. As landings increase, the economic impacts will increase (assuming all other factors remain proportionally constant). Similarly, as landings or market price for seafood decrease, the economic impacts will also likely fall.

This is of interest given the reported constraints on moorage space that confront the seafood processing/packing activities on Gloucester. Seafood-laden vessels returning from a trip will moor in a parallel fashion at the dock in front of one of the facilities. The seafood is off-loaded by hand or mechanically. This task is time consuming and requires the use of both vessel deckhands and workers from the landside. Once the vessel is emptied, it will move out of the way to make room for the next vessel to be off-loaded. The empty vessel will moor at an adjacent location and begin servicing (i.e., maintenance, refueling, repair, etc.) required for the next trip. Vessels will be moored three and four abreast for several days as they wait servicing for the next trip. The logistics of accepting additional vessels to be off-loaded becomes a problem when there is insufficient room at the docks to moor empty vessels. When the moorage space within the basin is fully utilized, incoming vessels may need to be off-loaded at other suitable locations which are limited in number and capability.

In such an event the economic activity associated with the seafood products that would have been off-loaded in Gloucester is lost to the local economy; as well as the provisioning of the vessels for the next fishing voyage. These values provide an estimate of the economic impact that is lost to the local economy if a seafood vessel is turned away from Gloucester and off-loaded in an alternative port facility out of the region.

Aberdeen Creek Value Added Analysis

As an additional inquiry the amount of locally landed seafood that remains in the County for further processing, handling and distribution at the wholesale and retail levels determine the additional impact of every dollar of seafood products landed at Aberdeen Creek.

There is not detailed market channel distribution information for Gloucester landed seafood to determine how much of the product adds additional value added levels to the community via processing, secondary wholesale and consumption (both retail and food service). It is known via the interview process that considerable quantities of crabs and oysters ultimately are consumed in Gloucester County or are subject to further value added distributions. To address that additional economic activity and for the sake of exposition it is assumed for additional modelling purposes that 25% or 50% of the product landed via Aberdeen Creek remains in County for additional value added activity. The impacts associated with the product flow/mark up assumptions are shown in Tables 2-5.

Table 2. Markup and Value Added− 25% of Aberdeen Creek Harvest Remains in Gloucester ($ Millions)				
	Value of Inputs	**Markup (%)**	**Markup ($)**	**Output Value**
Primary Wholesale	$0.88	77.5%	$0.68	$1.55
Processors / Secondary Wholesale	$1.55	62.7%	$0.97	$2.53
Retail: Food Service	$1.26	182.4%	$2.30	$3.57
Retail: Food Marketing	$1.26	33.4%	$0.42	$1.69

Harvesters + Processing		Table 3. Gloucester County− 25% Aberdeen Creek Harvest Remains in Gloucester ($ Millions)							
		Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Labor Income Impacts	Direct Impacts	$3.33	$3.49	$3.66	$3.83	$3.99	$4.16	$4.33	$4.49
	Indirect Impacts	$0.15	$0.15	$0.16	$0.17	$0.18	$0.18	$0.19	$0.20
	Induced Impacts	$0.40	$0.42	$0.44	$0.46	$0.48	$0.50	$0.52	$0.54
	Total	$3.87	$4.07	$4.26	$4.46	$4.65	$4.84	$5.04	$5.23
Indirect Business Tax Impacts	Direct Impacts	$0.10	$0.10	$0.11	$0.11	$0.12	$0.12	$0.13	$0.13
	Indirect Impacts	$0.02	$0.02	$0.02	$0.03	$0.03	$0.03	$0.03	$0.03
	Induced Impacts	$0.12	$0.12	$0.13	$0.13	$0.14	$0.14	$0.15	$0.16
	Total	$0.24	$0.25	$0.26	$0.27	$0.28	$0.30	$0.31	$0.32
Other Property Income Impacts	Direct Impacts	$0.66	$0.69	$0.73	$0.76	$0.79	$0.83	$0.86	$0.89
	Indirect Impacts	$0.06	$0.07	$0.07	$0.07	$0.08	$0.08	$0.08	$0.09
	Induced Impacts	$0.36	$0.38	$0.40	$0.41	$0.43	$0.45	$0.47	$0.49
	Total	$1.09	$1.14	$1.19	$1.25	$1.30	$1.36	$1.41	$1.47
Total Value Added Impacts	Direct Impacts	$4.09	$4.29	$4.50	$4.70	$4.91	$5.11	$5.31	$5.52
	Indirect Impacts	$0.23	$0.24	$0.26	$0.27	$0.28	$0.29	$0.30	$0.31
	Induced Impacts	$0.88	$0.92	$0.96	$1.01	$1.05	$1.10	$1.14	$1.18
	Total	$5.20	$5.46	$5.72	$5.98	$6.24	$6.50	$6.76	$7.02
Output Impacts	Direct Impacts	$7.42	$7.79	$8.17	$8.54	$8.91	$9.28	$9.65	$10.02
	Indirect Impacts	$0.47	$0.50	$0.52	$0.55	$0.57	$0.59	$0.62	$0.64
	Induced Impacts	$1.47	$1.54	$1.62	$1.69	$1.76	$1.84	$1.91	$1.99
	Total	$9.37	$9.84	$10.30	$10.77	$11.24	$11.71	$12.18	$12.65
Employment Impacts (# Jobs)	Direct Impacts	160	168	176	184	192	200	208	216
	Indirect Impacts	4	4	4	5	5	5	5	5
	Induced Impacts	14	15	15	16	17	17	18	19
	Total	178	187	196	204	213	222	231	240

Table 4. Markup and Value Added – 50% of Aberdeen Creek Harvest Remains in Gloucester ($ Millions)

	Value of Inputs	Markup (%)	Markup ($)	Output Value
Primary Wholesale	$1.75	77.5%	$1.36	$3.11
Processors / Secondary Wholesale	$3.11	62.7%	$1.95	$5.05
Retail: Food Service	$2.53	182.4%	$4.61	$7.14
Retail Markets	$2.53	33.4%	$0.84	$3.37

Table 5. Gloucester Count Impacts− 50% of Products Remains in Gloucester ($ Millions)

Harvesters + Processing		Baseline	Baseline + Increment Year 1	Baseline + Increment Year 2	Baseline + Increment Year 3	Baseline + Increment Year 4	Baseline + Increment Year 5	Baseline + Increment Year 6	Baseline + Increment Year 7
Labor Income Impacts	Direct Impacts	$5.91	$6.20	$6.50	$6.79	$7.09	$7.39	$7.68	$7.98
	Indirect Impacts	$0.22	$0.23	$0.24	$0.25	$0.26	$0.27	$0.28	$0.29
	Induced Impacts	$0.71	$0.74	$0.78	$0.81	$0.85	$0.88	$0.92	$0.95
	Total	$6.83	$7.17	$7.52	$7.86	$8.20	$8.54	$8.88	$9.22
Indirect Business Tax Impacts	Direct Impacts	$0.17	$0.18	$0.19	$0.20	$0.21	$0.21	$0.22	$0.23
	Indirect Impacts	$0.03	$0.03	$0.04	$0.04	$0.04	$0.04	$0.04	$0.04
	Induced Impacts	$0.20	$0.21	$0.22	$0.23	$0.24	$0.25	$0.26	$0.27
	Total	$0.41	$0.43	$0.45	$0.47	$0.49	$0.51	$0.53	$0.55
Other Property Income Impacts	Direct Impacts	$1.30	$1.37	$1.43	$1.50	$1.56	$1.63	$1.69	$1.76
	Indirect Impacts	$0.11	$0.11	$0.12	$0.12	$0.13	$0.13	$0.14	$0.15
	Induced Impacts	$0.63	$0.67	$0.70	$0.73	$0.76	$0.79	$0.82	$0.86
	Total	$2.04	$2.15	$2.25	$2.35	$2.45	$2.55	$2.66	$2.76
Total Value Added Impacts	Direct Impacts	$7.38	$7.75	$8.12	$8.49	$8.86	$9.23	$9.60	$9.96
	Indirect Impacts	$0.36	$0.38	$0.39	$0.41	$0.43	$0.45	$0.46	$0.48
	Induced Impacts	$1.54	$1.62	$1.70	$1.78	$1.85	$1.93	$2.01	$2.09
	Total	$9.28	$9.75	$10.21	$10.68	$11.14	$11.60	$12.07	$12.53
Output Impacts	Direct Impacts	$11.35	$11.91	$12.48	$13.05	$13.62	$14.18	$14.75	$15.32
	Indirect Impacts	$0.74	$0.78	$0.82	$0.85	$0.89	$0.93	$0.97	$1.00
	Induced Impacts	$2.59	$2.72	$2.85	$2.98	$3.11	$3.24	$3.37	$3.50
	Total	$14.68	$15.41	$16.15	$16.88	$17.62	$18.35	$19.08	$19.82
Employment Impacts (# Jobs)	Direct Impacts	220	231.46	242	254	265	276	287	298
	Indirect Impacts	6	$6.43	7	7	7	8	8	8
	Induced Impacts	25	25.78	27	28	29	31	32	33
	Total	251	263.67	276	289	301	314	326	339

Conclusions

The seafood processing/packing industry on Gloucester represents an important component of the local economy. Activities associated with harvesting, offloading, processing, packing, and shipping seafood from the Gloucester facilities has been shown to be intrinsically linked with several sectors of the local economy. These activities create positive economic impacts to the local economy as seafood products are sold to buyers located outside of Gloucester and non-residents purchase seafood locally. The sale of seafood to both local and non-local buyers results in the purchase of inputs from a variety of service and supply firms, and the distribution of incomes to local employees. These expenditures are circulated within the Gloucester economy as these dollars are spent and re-spent. The total economic impact of the Gloucester seafood industry depends on the amount of seafood landings and the general economic conditions that exist at any given time. Thus, the actual impact values will vary from year to year.

The recent resurgence of seafood landings at Aberdeen Creek provide a glimpse of what may be in the future. The tables above summarized a post dredging build-out in landings based upon an average increase of 5% per year. As summarized below in Table 6, even the existing economic activity is already significant for just the landings at Aberdeen Creek. As is also shown much of the product may remain in the County for further processing and distribution adding to the actual economic impacts are significant.

These values can also be viewed as the losses associated with an offloading event that may be diverted from Gloucester if commercial fishing waterfront facilities in Gloucester are in accessible due to water depth or otherwise made unavailable.

This study has shown that the seafood processing/packing industry on Gloucester generates positive economic impacts to the local economy. Any decisions to address the water access for commercial seafood operations such as those that currently exist should carefully consider the economic contributions associated with the industry, while comparing against the costs of creating additional moorage space or reconfiguring the existing dock space.

Table 6. Total Economic Impacts Based on Aberdeen Creek Product Flow ($ Millions)

Impact Measure	Landings Only	25% Remains in Gloucester	50% Remains in Gloucester
Output	$4.05	$9.37	$14.68
Income	0.92	3.87	6.83
Employment (# Jobs)	105	178	251
Value Added	1.11	5.20	9.28
Indirect Business Taxes	0.07	0.24	0.41
Other Property Income Impacts	$.13	$1.09	$2.04

Appendix 1. Glossary of Input-Output Terms

Direct effects/impacts: Direct impacts represent the revenues, value-added, income, or jobs that result directly from an economic activity within the study area or a regional economy.

Employment or Jobs: Represents the total numbers of wage and salaried employees as well as self-employed jobs. This includes full-time, part-time and seasonal workers measured in annual average jobs.

Indirect Business Taxes: Include sales, excise, and property taxes as well as fees and licenses paid by businesses during normal operations. It does not include taxes on profits or income.

Indirect effects/impacts: Indirect effects occur when businesses use revenues originating from outside the region, or study area, to purchase inputs (goods and services) from local suppliers. This secondary, or indirect business, generates additional revenues, income, jobs and taxes for the area economy.

Induced effects/impacts: Induced effects or impacts occur when new dollars, originating from outside the study area, are introduced into the local economy. Induced economic impacts occur as the households of business owners and employees spend their earnings from these enterprises to purchase consumer goods and services from other busi-

nesses within the region. This induced effect generates additional revenues, income, jobs and taxes for the area economy.

Input-Output Analysis: The use of input-output models to estimate how revenues or employment for one or more particular industries, businesses or activities in a regional economy impact other businesses and institutions in that region, and the regional as a whole.

Input-Output Models: A mathematical representation of economic activity within a defined region using inter-industry transaction tables or matrices where the outputs of various industries are used as inputs by those same industries and other industries as well.

Labor Income: All forms of employment compensation, including employee wages and salaries, and proprietor income or profits.

Local/ Resident revenues/expenditures: Local revenues or spending represent simple transfers between individuals or businesses within a regional economy. These transactions do not generate economic spin-off or multiplier (indirect and induced) effects.

Margins: Represent the differences between retail, wholesale, distributor and producers prices.

Non-resident /Non-local revenues/expenditures: When outside or new revenues flow into a local economy either from the sale of locally produced goods and services to points outside the study area, or from expenditures by non-local visitors to the study area, additional economic repercussions occur through indirect and induced (multiplier) effects.

Other Property Type Income: Income in the form of rents, royalties, interest, dividends, and corporate profits.

Output: Revenues or sales associated with an industry or economic activity.

Total Impacts: The sum of direct, indirect and induced effects or economic impacts.

Value-added: Includes wages and salaries, interest, rent, profits, and indirect taxes paid by businesses. In the IMPLAN results tables, Value-added equals the sum of Labor Income, Other Property Type Income, and Indirect Business Taxes.

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Appendix 3

Analysis of Select Working Waterfront Site, Weems/ Ampro Marine Railway

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Analysis of Select Working Waterfront Site, Weems/ Ampro Marine Railway

Photo courtesy of NNPDC, taken on September 19, 2009.

Report Prepared by

March 2015

Analysis of Select Working Waterfront Site, Weems/ Ampro Marine Railway

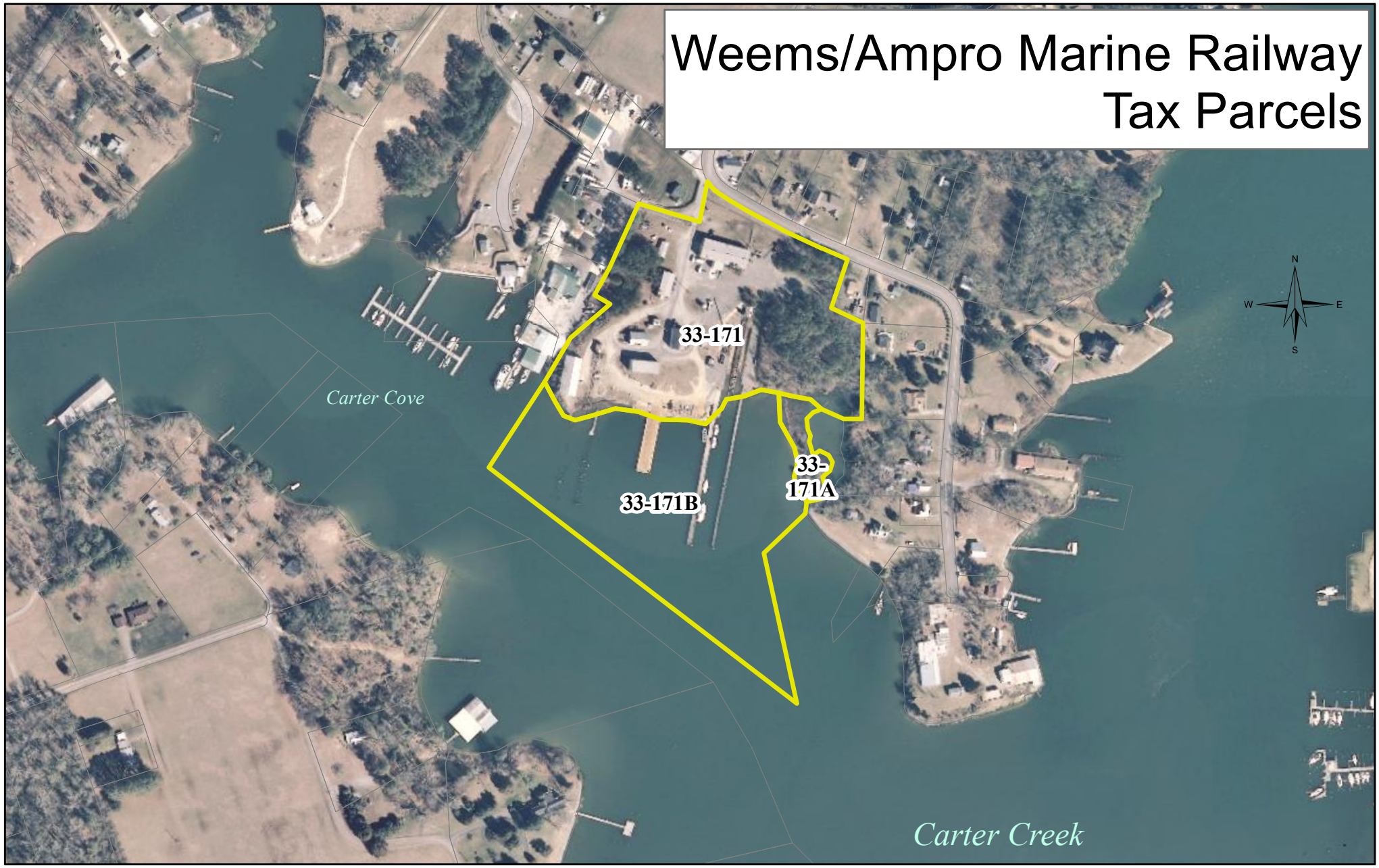
The Ampro Marine Railway, in one form or another, has been repairing fishing and pleasure boats for more than a century in the village of Weems, located in Lancaster County on Virginia's Northern Neck, according to the long-standing Commissioner of the Revenue of Lancaster County Sonny Thomas. The following analysis will examine local planning and zoning constraints as well as local fiscal policy implications for an existing or future commercial water dependent industry.

Background

The Weems/Ampro Marine Railway is located off Carter Cove, part of the western edge of Carter Creek, off the Corrotoman River in Lancaster County, Virginia. NNPDC staff traveled to Carter Cove in 2009 and took several pictures of the Weems/Ampro Marine Railway. These photos can be seen in Appendix A. There are three parcels that make up the facility. The main tax parcel is identified as Lot 33-171 and consists of 7.842 acres of land. The second parcel is a small parcel of mostly marsh, is designated Lot 33-171A, and covers 0.09 acres adjacent to a tidal pond. This parcel is connected to the southeast corner of the larger, main parcel (33-171). The final parcel (33-171B) is a relic from the King of England Land Grants from Virginia's colonial past and is the creek bottom of Carter Cove in front of the main parcel and covers 8.00 acres of the creek. (See Map 1, on the next page, as well as the property records for each of the parcels, contained in Appendix B).

Originally, the London Company, by virtue of its royal charter, owned all lands, including those beneath navigable waters in Virginia. It has often been thought neither the London Company nor the Crown could or did make grants of subaqueous lands during the colonial period in Virginia. However, that assumption was negated by the Virginia Supreme Court's decision in the *Commonwealth vs. Morgan* in 1983. The complainants in the *Commonwealth vs. Morgan* brought suit for declaratory judgment in the Circuit Court of Lancaster County, Chancery Division, claiming that they were owners in fee simple of certain submerged lands and oyster bottoms in Carter Cove, a navigable waterbody part of Carter Creek. The defendants, the Commonwealth of Virginia and the Virginia Marine Resources Commission, had claimed state ownership of the tracts in question. Specifically, they had attempted to charge one of the complainants a royalty for an oyster shell pile and a bulkhead below mean water mark and had published notice of the application on an individual (also a defendant in the case) for a lease of the bottom of Carter Cove. The Commonwealth offered no evidence, choosing to treat the case as involving only a legal issue: whether the King of England had the authority to through

Weems/Ampro Marine Railway Tax Parcels



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This project was funded by the Northern Neck Planning District Commission and the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant #NA14NOS4190141 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended.

his agent in Virginia, the Royal Governor, to grant the submerged lands of navigable waters to private parties. The Commonwealth argued that after the Magna Carta, the Crown no longer had the power to grant tidal water bottoms without the consent of Parliament, which was not present in this case. The trial court rejected the Commonwealth's argument and held that the plaintiffs had fee simple ownership of the submerged lands included within the colonial patents free from any ownership or other property interest of the Commonwealth. The court enjoined the defendants from "exercising or attempting to exercise ownership, dominion, or control" of the plaintiff's creek bottoms. The plaintiff's ownership interest was restricted only by the public's right of navigation and passage over the waters of Carter's Cove. The case was appealed to the Virginia Supreme Court, which upheld the lower trial court's determination on both the factual issue (whether the creek bottom was included in the land patents) and the legal issue (whether the King had the power to grant the beds of navigable waterbodies.

When property owners trace the land patents to a Kings Grant, the property owner has control and primary rights over the creek bottom within their tax parcel. While the property owner has control of the creek bottom, this does not give him exclusive rights to use the water. For instance, the public has a right to navigate over his creek bottom, since this is a tidal creek that eventually connects to the Chesapeake Bay and Atlantic Ocean. As the rivers were the transportation corridors for early Virginia, the government had good reason to maintain public navigation, so there would be no impediments to get goods back to England, even when a King's Grant conveyed the tidal creek bottom. There are, however, some differing opinions regarding the implications of fishing rights when an individual owns a section of creek bottom. Some interpret the ownership of the creek bottom to include exclusive fishing rights (both finfish and shellfish) within this area of creek bottom owned. Another interpretation is that the owner of the creek bottom has exclusive rights only to the shellfish resting on his creek bottom land, but not to the finfish that swim around in the water column of the creek. Therefore, in this interpretation, the owner must allow the public to fish above his creek bottom but can prohibit shellfishing.

Virginia Marine Resources Commission staff were contacted to determine if the Ampro Marine Railway creek bottom parcel (33-171B) in Carter's Cove was included within the *Commonwealth vs. Morgan* court decision. VMRC staff indicated that they believed the Ampro tax parcel to be included within the 1983 *Commonwealth vs. Morgan* court decision, as all waters of Carter Cover upstream from John's Neck Point and Sloop Landing Point were included in this court decision. This means that the property owner of the Weems/Ampro Marine Railway does not have to apply for a permit from the Virginia Marine Resources Commission to construct structures on the bottom (such as piers, docks, wharves, and even buildings), or place oyster shell for oyster growing operations since they own the property rights for the creek bottom within that parcel. However, although the property owner of the Weems/Ampro Marine

Railway is exempt from state marine bottom laws, the owner would still need to obtain a wetlands permit from the federal government through the Army Corps of Engineers for any activities involving the creek bottom. This creek bottom parcel (33-171B) is an important asset of the Weems/Ampro Marine Railway, and since it has already been determined to be owned fee simple by the courts, the creek bottom parcel offers the property owner tremendous flexibility for future infrastructure for commercial water dependent uses.

Local Zoning Considerations

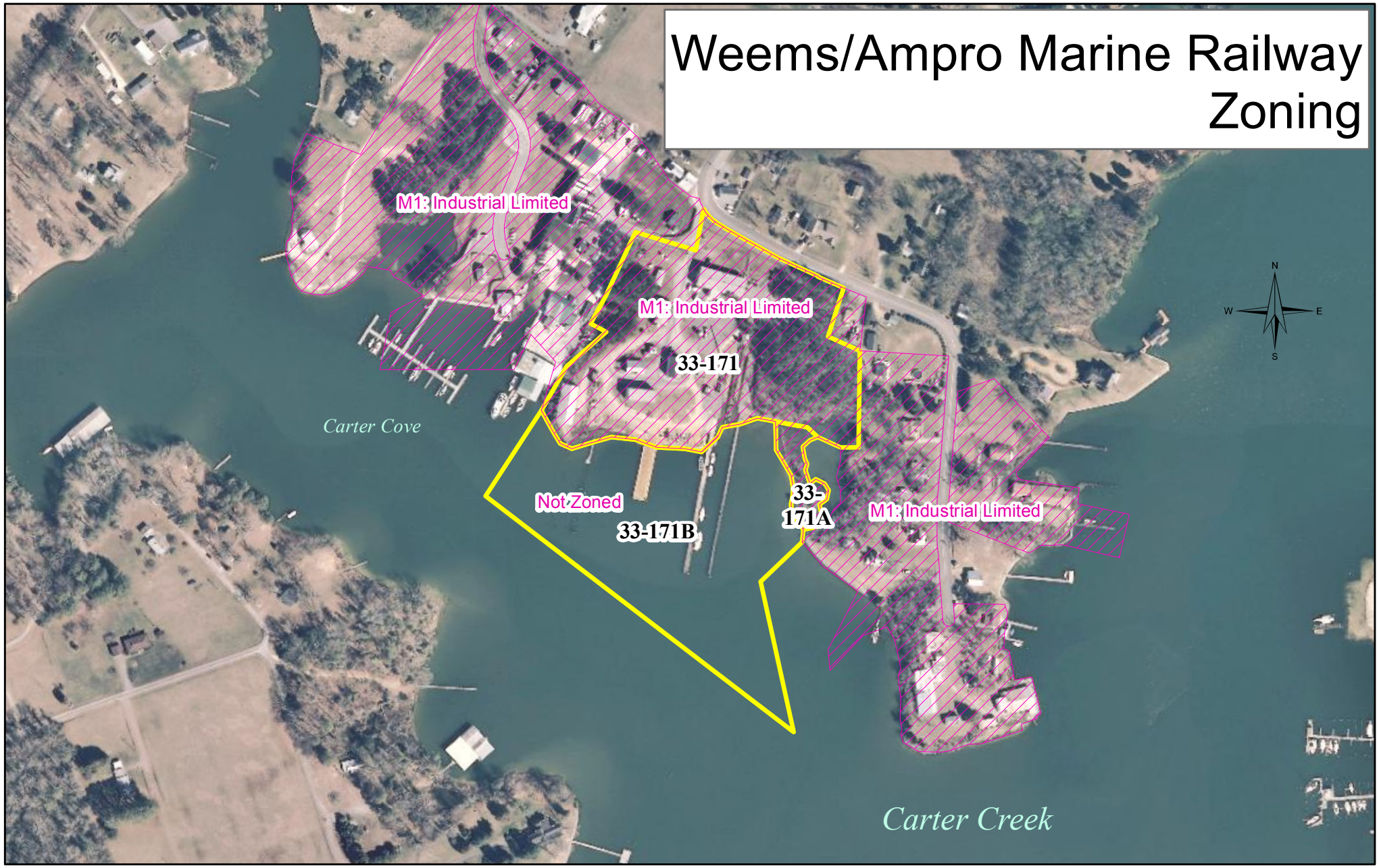
The two land parcels, 33-171 and 171A, are classified by the Lancaster County Zoning Ordinance as M1, Industrial Limited (See Map 2 on the next page). There are multiple working waterfront uses allowed in the Lancaster County M1 zoning classification, Industrial Limited (To see all uses allowed in M1, see Appendix C). A business use allowed by right in Lancaster County's M1 zoning classification is Boat Building and Boat Repair, which is the classification that applies to the current Weems/Ampro Marine Railway operation. Subsequent owners of the property could continue to repair or build boats on this property, as the zoning conveys when the property is sold. According to the Lancaster County Zoning Ordinance, another business that is water dependent and is allowed by right in M1 zoned areas are manufacture, compounding, processing, packaging, or treatment of seafood products, or shell. In addition a marina, which may include boat and accessory sales, boat storage, engine and boat repairs would be allowed in the M1 zoning class with a special exception by the Lancaster County Board of Supervisors. The Lancaster County Zoning administrator noted that the M1 zoning classification conveys to subsequent property owners, as the zoning classification is tied to the parcel and not the business. The Lancaster County Zoning Administrator noted that the creek bottom parcel (33-171B) is not zoned. However, on the property card at the Lancaster County Commissioner of the Revenue, the zoning category for the 33-171B tax parcel is not blank and states it is M1. For the purposes of this report, 33-171 B is considered not zoned, as the Zoning Administrator makes that determination. Technically, without any zoning limitations on the creek bottom parel, there is little constraint as to how that creek bottom is used, although, as stated earlier, Federal Clean Water and Wetland Permits must be obtained before any construction begins. Again, the creek bottom parcel, being privately owned and without zoning constraints offers tremendous flexibility to its use into the future by the owners of Tax Parcel 33-171B.

Note on Lancaster County Zoning Non Conforming Uses

While not applicable to the Weems/Ampro Marine Railway case study, it is important to note that article 12-1-3 in the Non Conforming Uses section of the Lancaster Zoning Ordinance, has unique provisions to protect certain working waterfront businesses. The article states:

> *12-1-3. If any nonconforming use (structure or activity) is discontinued for a period exceeding two years, after the enactment of this ordinance, it shall be deemed abandoned and any subsequent use shall conform to the requirements of the ordinance. For the purposes of this section, such seasonal and temporary uses as crop farming, oyster houses, oyster shucking houses, crab houses, fish and food processing activities and sawmills shall be exempted.*

Weems/Ampro Marine Railway Zoning



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As stated above, nonconforming uses such as oyster houses, oyster shucking houses, crab houses , and fish processing activities are exempt from the two year of business inactivity rule that constrains other nonconforming uses in the County. This non conforming use exemption is one way that Lancaster County shows how much it values the county's seafood industry, and allows such nonconforming uses to continue.

Local Tax Policy

Some counties tax parcels at their highest and best use (which for waterfront property is usually residential), but the Weems/Ampro Marine Railway is taxed at its current use, according to the Lancaster Commissioner of Revenue. The taxes imposed by Lancaster County include the machinery and tool tax ($1.52 per $100 of value), merchants capital tax ($1.00 per $100 of value),and real estate taxes, which include improvements to the real estate, at $0.54 per $100 of assessed value. Lancaster County does have land use value taxation for land in agricultural use within the county, but no such program for forested areas.

Main Tax Parcel (33-171) The main tax parcel (33-171) commercial use area with structures (3 acres) is assessed at $180,000/acre, and the commercial use area without structures (4.842 acres) is assessed at $9,000/acre. This equates to a total of $583,600 for the 7.842 acres in taxes on the land value. There are 16 improvements to the parcel, ranging from a metal office building and a metal boat house to a pole shed and several shop buildings. Also listed are chain link fencing, piers/docks, a bulkhead, and a dry dock system (the marine railway), which is assessed at $124,600 (see Appendix B for the complete list of improvements). In total, all improvements to the property add up to $416,356. Therefore the total assessed real estate tax value of $999,956 and is rounded up by the Commissioner of the Revenue to $1,000,000. With the Lancaster County real estate tax at $0.54 cents per $100, the yearly real estate tax bill equates to $5,400.

Small Tax Parcel, Southeast of Main Parcel (33-171A) This smaller tax parcel has no improvements it and the aerial photographs show the property to be tidal marshland, as it is a narrow sliver of land that divides a tidal pond from Carters Cove. The size of the parcel of land is 0.09 acres according to the landbook and appears to be an unbuildable parcel of land. The value of the land of this parcel is assessed at $800, therefore the real estate tax bill for this parcel equals $4.32.

Caters Cove Creek Bottom Tax Parcel (33-171B) The creek bottom parcel covers the area offshore of the main tax parcel, and is 8 acres in total. The western edge of the parcel extends approximately 252 feet into the creek and is elongated on the eastern side and juts out further to a point, which is approximately 653 feet from the shoreline, which curves inward as you go eastward. As mentioned previously, this land has been traced back to a Kings Grant, and thus the creek bottom is privately owned. There are no improvements shown on this parcel, as the bulkhead, piers/docks and dry dock system (marine railway) is attached to and accounted for on the main parcel (33-171). The value of the 8 acres of creek bottom is assessed at $500 per acre, therefore the total assessed value is $4,000. The real estate tax bill for this parcel is $21.60.

Machinery and Tools Tax

NNPDC staff, when interviewing the Lancaster County Commissioner of the Revenue, asked whether farmers in the county are exempt from the Machinery and Tools Tax. The Commissioner of the Revenue explained that farmers are not exempt from the Machinery and Tools Tax and pay $1.52 per $100 on machinery and tools, just as all other sectors of the economy. Therefore, NNPDC staff did not investigate the Machinery and Tools taxes for the Weems/Ampro Marine Railway, as all businesses in the county pay the same taxes at the same rate.

Possible Weems Working Waterfront Economic Incentives

The Northern Neck Planning District Commission administers the Economic Development Authority (EDA) Enterprise Zone Program for the Northern Neck Region. Established by the General Assembly in 1982, the Virginia Enterprise Zone Program is a partnership between the state and local governments to stimulate job creation and private investment within designated areas throughout Virginia. Currently, the Northern Neck has over 11,000 acres designated as enterprise zones. Enterprise Zones offer businesses a package of state and local incentives in the form of tax relief and grants, local regulatory flexibility, and local infrastructure development.

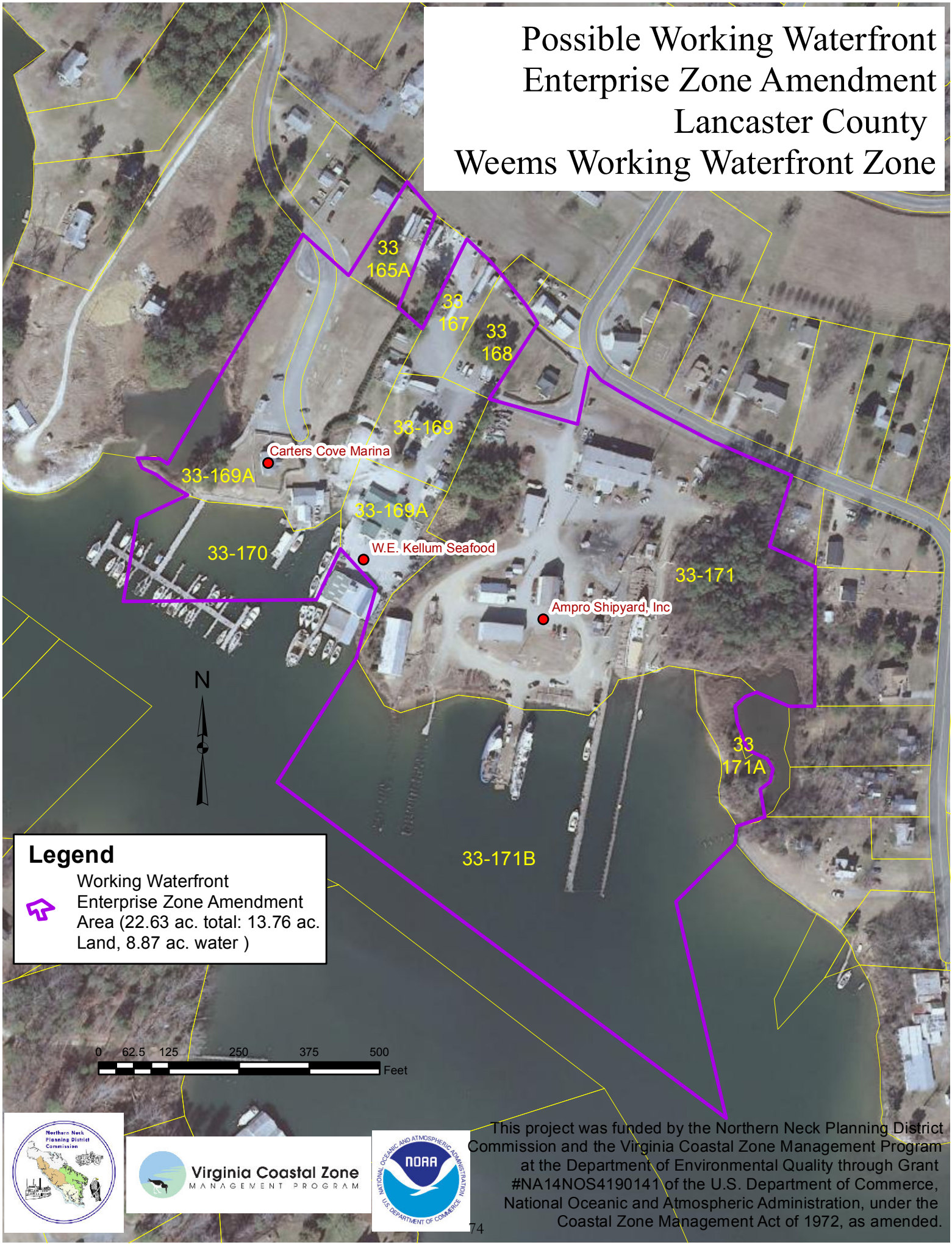
There are two types of assistance available if a business is located in an established enterprise zone: 1) a job creation grant and 2) a real property investment grant (RPIG). In order to be eligible for the RPIG grant, a business must invest at least $100,000 to meeting the minimum threshold for investment, with grants available in amounts up to 20% of the qualified real property investment above the respective eligibility threshold (which is the amount invested that exceeds $100,000).

For example, if a business located in an enterprise zone area invested $250,000 in qualified real property investments (as determined by the Virginia Enterprise Zone criteria), the business could be eligible for a grant up to 20% of the amount of money invested over $100,000, in this case, $150,000. Multiplying $150,000 by 20%, the business could be eligible for up to $30,000 in grant funding for its investment of $250,000. It should be noted that the grant amount is subject to proration should requests exceed grant funds allocated. Detailed information regarding the RPIG grant program, eligibility requirements and the application process are available here: http://www.dhcd.virginia.gov/index.php/community-partnerships-dhcd/downtown-revitalization/enterprise-zone.html

Lancaster County currently has in place an Enterprise Zone, and has not reached the maximum acreage allowed for the countywide Enterprise Zone. NNPDC staff, at request of the Lancaster County Administrator, drafted a map of a possible addition (amendment) to the Enterprise Zone to include the Weems Working Waterfront Area in the current Lancaster County

Enterprise Zone. The map on the following page shows the proposed Weems Working Waterfront Enterprise Zone addition area, which consists of the majority of properties in Weems that are zoned Light Industrial, M1. Included in the proposed amendment area are the Weems/Ampro Marine Railway, an adjacent oyster company and marina. NNPDC staff are available to assist Lancaster County should the County decide to move forward with the Enterprise Zone amendment.

Possible Working Waterfront Enterprise Zone Amendment
Lancaster County
Weems Working Waterfront Zone



This project was funded by the Northern Neck Planning District Commission and the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant #NA14NOS4190141 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended.

Appendix A - Weems/Ampro Marine Railway Photographs

Photograph taken from Carter Cover facing Northeast, courtesy NNPDC, September 18, 2009.

Photograph taken further upstream of Carter Cove, facing Northeast, courtesy NNPDC, September 18, 2009.

Photograph of Vessels Moored at the Weems/Ampro Marine Railway, courtesy NNPDC, September 19, 2009.

Photograph of Vessels Moored with Marine Railway in the Distance, courtesy NNPDC, September 18, 2009.

Appendix B - Weems/Ampro Marine Railway Property Records

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Map No.	33	171	CHESAPEAKE BAY FISHING CO LC	LANCASTER	WHITE STONE
Acct No.	10102		P O BOX 2056		
Rec No.	10076				
Acreage	7.842	Class 4	KILMARNOCK	VA	

Prt Date 2/24/2015

JOHN NECK 7.842 AC 22482

DB- 362 18
WB-
PB-

DB362/18

Assessed Value	
Year	1/01/2013
Land	583600
Improvement	416400
Total Value	1000000

LAND USE & VALUE				
Type	No. Acres	Price	Adj.%	Value
COMMERCIA	3	180000		540000
COMMERCIA	4.842	9000		43578

Front	Depth	Area	Unit	Depth Factor	Rate	Adj.%	

Total Land Value 583600

IMPROVEMENT DESCRIPTION

Exterior

Found.
Walls
Roof Type
Roofing

Interior

No. Rms.
Bd. Roms.
No. Baths
No.1/2 Bath
Walls
Floors
Heat Fuel A/C
Fireplace S- I- Gas FP:
Flue S- M-
Basem't Fin%. Fin.Rate
Garage No.Cars Car Port No.Cars
BLT.In Garage No.Cars

Site

R/W PUBLIC Water PUB-I Gas N
Ease PAVED Sewer SEPTIC Elect. Y
Terr. ON Utility Value
Char. LEVEL

FRONTS ON RT32

Dwl. No.	
Occupancy	VACANT-COMM
No.Story	
Age	
Cond.	
Class.	
Zoning	M1
No.Units	
Initals	DHXX
At Home	8/23/2012
Neighborhood	2

Structural Value

Structural Element	Value
Bldg.	
Basem't	
Fin.Basem't	
Plumb	
Heat	
A/C	
F.P.	
Flue	
Blt.In	
Interior Impr.	
Additions	

Sketch

Sec	Type	Cl	Str	Description	Area

OTHER IMPROVEMENTS

Description	Size	Cor	Rate	Depr %	Total Value
TOTAL IMPROVEMEN					416356

%Chgd 6-

Subtotal	
Factor	
Phys Depr.%	
Func Depr.%	
Econ Depr.%	
Total Depr.	
Nb.Adj.%	
Total Bldg. Val.	
Comp.%	
Other Imp.	416356
Imp. Adj.	
Total Imp. Val.	416400
Total Land	583600
Total Prop. Val.	1000000

From ACCT 10102 **Record No** 10076 01 **District** WHITE STONE **Class** 4 **Map #** 33 171

Record of Ownership

CHESAPEAKE BAY FISHING CO LC	Date Recorded	
P O BOX 2056	Deed or Will Book	362/ 18
KILMARNOCK VA 22482	Consideration	
	Date Recorded	
	Deed or Will Book	
	Consideration	
	Date Recorded	
	Deed or Will Book	
	Consideration	
	Date Recorded	
	Deed or Will Book	
	Consideration	
	Date Recorded	
	Deed or Will Book	
	Consideration	
	Date Recorded	
	Deed or Will Book	
	Consideration	

COMMENTS

JOHN NECK 7.842 AC ZONING: M1

DB362/18
PLAT-
INST# 0000000
7.842

YEAR	LAND VAL.	IMPV.VAL.	TOTAL VAL.	EXPLANATION
2013	583600	416400	1000000	.068 AC TO TM 33-169A
2013	584200	416400	1000600	GENERAL REASSESSMENT
2008	649100	416400	1065500	GENERAL REASSESSMENT

LAND USE

ACRES	USE VALUE	YEAR

BUILDING PERMITS

NO.	TYPE	DATE	% of Comp	ASSESSMENT

NOTES

.068 AC TO KELLUM OYSTER COMPANY LLC MERGED WITH TM 33-169A - 7/25/12 - LR12/1547

NAME CHESAPEAKE BAY FISHING CO LC LANCASTER

MAP# 33 171

ACCT 10102 R# 10076 DWL# 1

MAP# 33 171 OTHER IMPROVEMENTS AND BUILDING ADDITIONS

CODE	DESCRIPTION	SIZE	COND	RATE	DEPR	TOT VALUE
557	OFFICE-FRAME/METAL	4200.0SF	G	18.00	25	56,700
740	SHED-MACHINE	4000.0SF	G	10.00	25	30,000
783	SHOP-FRAME-POLE	220.0SF	P	500.00		500
783	SHOP-FRAME	2250.0SF	A	2,700.00		2,700
647	PUMP HOUSE		A	500.00		500
704	SHED-CINDERBLOCK	256.0SF	A	1,000.00		1,000
784	SHOP-METAL	2100.0SF	G	10.00	20	16,800
610	POLE SHED	600.0SF	A	1,000.00		1,000
073	BOAT HOUSE-METAL	6300.0SF	G	12.00	20	60,480
000	OLD 2S FR	3840.0SF	A	8.00	65	10,752
784	SHOP-METAL	1360.0SF	G	16.00	2	21,324
000	METAL HAUL HOUSE	350.0SF	G	15.00	20	4,200
251	FENCE-CHAIN LINK	1500.0SF	A	6.00	40	5,400
591	PIERS/DOCKS	14880.0SF	A	20.00	75	74,400
106	BULKHEAD		A	6,000.00		6,000
000	DRY DOCK SYSTEM		A	124,600.00		124,600

			TOTAL OTHER	IMPROVEMENTS		416,356 **

BUILDING ADDITIONS

Map No.	33 171A	CHESAPEAKE BAY FISHING CO LC	LANCASTER	WHITE STONE	Prt Date 2/24/2015
Acct No.	10103	P O BOX 2056			
Rec No.	10077				
Acreage	.090	Class 4	KILMARNOCK	VA	

JOHN NECK .09 AC 22482

DB- 362 18
WB-
PB-

DB362/18

Assessed Value	
Year	1/01/2013
Land	800
Improvement	
Total Value	800

LAND USE & VALUE

Type	No. Acres	Price	Adj.%	Value
COMMERCIA	.09	800		800

Front	Depth	Area	Unit	Depth Factor	Rate	Adj.%

Total Land Value 800

IMPROVEMENT DESCRIPTION

Exterior

Found.
Walls
Roof Type
Roofing

Interior

No. Rms.
Bd. Roms.
No. Baths
No.1/2 Bath
Walls
Floors
Heat Fuel A/C
Fireplace S- I- Gas FP:
Flue S- M-
Basem't Fin%. Fin.Rate
Garage No.Cars Car Port No.Cars
BLT.In Garage No.Cars

Site

R/W PUBLIC Water NONE Gas N
Ease NONE Sewer NONE Elect. N
Terr. ON Utility Value
Char. LEVEL

Dwl. No.
Occupancy VACANT-COMM
No.Story
Age
Cond.
Class.
Zoning M1
No.Units
Initals DHXX
At Home 8/23/2012
Neighborhood 1

Structural Value

Structural Element	Value
Bldg.	
Basem't	
Fin.Basem't	
Plumb	
Heat	
A/C	
F.P.	
Flue	
Blt.In	
Interior Impr.	
Additions	

Sketch

Subtotal	
Factor	
Phys Depr.%	
Func Depr.%	
Econ Depr.%	
Total Depr.	
Nb.Adj.%	
Total Bldg. Val.	
Comp.%	
Other Imp.	
Imp. Adj.	
Total Imp. Val.	
Total Land	800
Total Prop. Val.	800

%Chgd 700

OTHER IMPROVEMENTS

Description	Size	Con	Rate	Depr %	Total Value

Sec	Type	Cl	Str	Description	Area

From ACCT 10103 **Record No** 10077 01 **District** WHITE STONE **Class** 4 **Map #** 33 171A

Record of Ownership

CHESAPEAKE BAY FISHING CO LC	Date Recorded	
P O BOX 2056	Deed or Will Book	362/ 18
KILMARNOCK VA 22482	Consideration	
	Date Recorded	
	Deed or Will Book	
	Consideration	
	Date Recorded	
	Deed or Will Book	
	Consideration	
	Date Recorded	
	Deed or Will Book	
	Consideration	
	Date Recorded	
	Deed or Will Book	
	Consideration	
	Date Recorded	
	Deed or Will Book	
	Consideration	
COMMENTS		

NOTES

JOHN NECK .09 AC ZONING: M1

DB362/18
PLAT-
INST# 0000000
.090

YEAR	LAND VAL.	IMPV.VAL.	TOTAL VAL.	EXPLANATION
2013	800		800	GENERAL REASSESSMENT
2008	100		100	GENERAL REASSESSMENT
2004	100		100	GENERAL REASSESSMENT

LAND USE

ACRES	USE VALUE	YEAR

BUILDING PERMITS

NO.	TYPE	DATE	% of Comp	ASSESSMENT

Map No.	33	171B	CHESAPEAKE BAY FISHING CO LC	LANCASTER	WHITE STONE
Acct No.	10104		P O BOX 2056		
Rec No.	10078				
Acreage	8.000	Class 4	KILMARNOCK VA 22482		

Prt Date 2/24/2015

JOHN NECK 8.00 AC
CREEK BOTTOM

DB- 362 18
WB-
PB-

DB362/18

Assessed Value	
Year	1/01/2013
Land	4000
Improvement	
Total Value	4000

LAND USE & VALUE				
Type	No. Acres	Price	Adj.%	Value
OTHER	8	500		4000

Front	Depth	Area	Unit	Depth Factor	Rate	Adj.%

IMPROVEMENT DESCRIPTION

Exterior

Found.
Walls
Roof Type
Roofing

Interior

No. Rms.
Bd. Roms.
No. Baths
No.1/2 Bath
Walls
Floors
Heat Fuel A/C
Fireplace S- I- Gas FP:
Flue S- M-
Basem't Fin%. Fin.Rate
Garage No.Cars Car Port No.Cars
BLT.In Garage No.Cars

Site

R/W PUBLIC Water NONE Gas N
Ease NONE Sewer NONE Elect. N
Terr. ON Utility Value
Char. LEVEL

Dwl. No.
Occupancy VACANT-COMM
No.Story
Age
Cond.
Class.
Zoning M1
No.Units
Initals DHXX
At Home 8/23/2012
Neighborhood 2

Structural Value

Structural Element	Value
Bldg.	
Basem't	
Fin.Basem't	
Plumb	
Heat	
A/C	
F.P.	
Flue	
Blt.In	
Interior Impr.	
Additions	

Sketch

Total Land Value 4000

Sec	Type	Cl	Str	Description	Area

OTHER IMPROVEMENTS

Description	Size	Cor	Rate	Depr %	Total Value

%Chgd 67

Subtotal	
Factor	
Phys Depr.%	
Func Depr.%	
Econ Depr.%	
Total Depr.	
Nb.Adj.%	
Total Bldg. Val.	
Comp.%	
Other Imp.	
Imp. Adj.	
Total Imp. Val.	
Total Land	4000
Total Prop. Val.	4000

From ACCT 10104 **Record No** 10078 01 **District** WHITE STONE **Class** 4 **Map #** 33 171B

Record of Ownership

CHESAPEAKE BAY FISHING CO LC	Date Recorded	
P O BOX 2056	Deed or Will Book	362/ 18
KILMARNOCK VA 22482	Consideration	
	Date Recorded	
	Deed or Will Book	
	Consideration	
	Date Recorded	
	Deed or Will Book	
	Consideration	
	Date Recorded	
	Deed or Will Book	
	Consideration	
	Date Recorded	
	Deed or Will Book	
	Consideration	
	Date Recorded	
	Deed or Will Book	
	Consideration	

COMMENTS

NOTES

THIS LAND IS SUBMERGED-CREEK BOTTOM

JOHN NECK 8.00 AC ZONING: M1
CREEK BOTTOM

DB362/18
PLAT-
INST# 0000000
8.000

YEAR	LAND VAL.	IMPV.VAL.	TOTAL VAL.	EXPLANATION
2013	4000		4000	GENERAL REASSESSMENT
2008	2400		2400	CREEK BOTTOM
2008	32000		32000	GENERAL REASSESSMENT

LAND USE

ACRES	USE VALUE	YEAR

BUILDING PERMITS

NO.	TYPE	DATE	% of Comp	ASSESSMENT

Appendix B - Lancaster County Zoning Ordinance, Light Industrial, M1

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ARTICLE 9. - INDUSTRIAL, LIMITED, DISTRICT M-1
Statement of Intent

The primary purpose of this district is to provide areas where certain industries may be appropriately located to foster job creation and economic development. The limitations on (or provisions relating to) height of building, horsepower, heating, flammable liquids or explosives, controlling emission of fumes, landscaping, and the number of persons employed are imposed to protect and foster adjacent residential desirability while permitting industries to locate near a labor supply.

(Ord. of 12-21-09)

9-1. - Use regulations.

In industrial district M-1 any structure to be erected or land to be used shall be for one or more of the following uses:

9-1-1. Assembly of electrical appliances, radios, computers and similar devices.

9-1-2. Automobile assembling, painting, upholstering, repairing, rebuilding, reconditioning, body and fender work, truck repairing or overhauling, tire retreading or recapping, or battery manufacture.

9-1-3. Blacksmith shop, welding or machine shop.

9-1-4. Laboratories, pharmaceutical and/or medical.

9-1-5. Manufacture, compounding, processing, packaging, or treatment of such products as bakery goods, candy, cosmetics, dairy products, perfumes, pharmaceuticals, toiletries, food and seafood products.

9-1-6. Manufacture, compounding, assembling or treatment of articles of merchandise from the following previously prepared materials: bone, cellophane, canvas, cloth, cork, feathers, felt, fiber, fur, glass, hair, horn, leather, paper, plastic, precious or semiprecious metals, or stones, shell, straw, textiles, tobacco, wood, yarn, and paint.

9-1-7. Manufacture of pottery and figurines or other similar ceramic products, using only previously pulverized clay, and kilns.

9-1-8. Manufacture of musical instruments, toys, novelties and rubber and metal stamps.

9-1-9. Building material sales yards, plumbing supplies.

9-1-10. Coal and wood yards, lumberyards, feed and seed stores.

9-1-11. Contractors' equipment storage yards or plants, or rental of equipment commonly used by contractors.

9-1-12. Cabinet, furniture and upholstery shops.

9-1-13. Boat building and repair.

9-1-14. Commercial marina, which may include boat and accessory sales, boat storage, engine and boat repairs, with a special exception.

(Ord. of 11-20-95)

9-1-15. Monumental stone works.

9-1-16. Veterinary or dog or cat hospital and/or kennels, with a special exception.

9-1-17. Truck terminals.

9-1-18. Airports and airstrips, with a special exception.

9-1-19. Wholesale businesses, storage warehouses.

9-1-20. Offstreet parking as defined.

9-1-21. Public utility generating, booster or relay stations, transformer substations, transmission lines and towers, and other facilities for the provision and maintenance of public utilities, including railroads and facilities, and water and sewer lines.

9-1-22. Petroleum storage, with a special exception.

9-1-23. Finfish and shellfish processing.

9-1-24. Junkyard, with a special exception.

9-1-25. Post office.

9-1-26. Major recreational equipment in accordance with article 19 of this ordinance.

9-1-27. County-sanctioned public facility.

9-1-28. Sandblasting and metal repair shop.

9-1-29. Yacht club.

(Ord. of 2-25-93)

9-1-30. Disposal of dredge spoil, with a special exception.

9-1-31. Other manufacturing or activities similar to those enumerated above but not specifically mentioned, with a special exception.

(Ord. of 12-13-92; Ord. of 2-25-93; Ord. of 1-25-96(1); Ord. of 12-21-09)

9-2. - Requirements for permitted uses.
9-2-1. Before a building permit shall be issued or construction commenced on any permitted use in the district, or a permit issued for a new use, the plans, in sufficient detail to show the operations and processes and information as required by Article 22 Site Plans, shall be submitted to the zoning administrator. The administrator shall refer completed plans to the planning commission for recommendation to the board of supervisors if the proposed activity requires a building permit and which involves a land area disturbance greater than 2,500 square feet. The planning commission shall make recommendations to the board of supervisors within 30 days after the plans are determined to be complete. The board of supervisors shall make its recommendations within 30 days of the planning commission decision. If formal notice in writing is given to the applicant, the time for action may be extended for a 30-day period. Failure to act on the application within the established time limit shall be deemed to constitute approval of the application. Modification of the plans may be required by the administrator based upon the recommendations by the board of supervisors.

9-2-2. Sufficient area shall be provided (a) to adequately screen permitted uses and storage materials from adjacent business and residential districts, (b) for offstreet parking of vehicles incidental to the industry, its employees and clients, (c) to plant necessary vegetative buffers and other types of landscaping that enhances aesthetic appeal of the structure, and (d) for adequate density of development.

(Ord. of 10-24-96(1); Ord. of 12-21-09)

9-3. - Area regulations.

For permitted uses utilizing individual sewage disposal systems, the required area for any such use shall be approved by the health official. Conditional septic disposal system permits which limit the use of the subject property to a specified portion of the year are hereby strictly prohibited.

(Ord. of 8-94; Ord. of 12-21-09)

9-4. - Setback regulations.

Buildings shall be located 100 feet or more from the centerline of any street or road right-of-way, but in no event less than 75 feet from the edge of the right-of-way. This shall be known as the "setback line." Signs advertising sale or rent of premises may be erected up to the property line.

(Ord. of 12-21-09)

9-5. - Frontage and yard regulations.

For permitted uses the minimum side and rear yards adjoining or adjacent to a residential district shall be 100 feet. The minimum side and rear yards abutting all other districts shall be 25 feet. Offstreet parking shall be in accordance with the provisions contained herein.

(Ord. of 12-21-09)

9-6. - Height regulations.

Buildings may be erected up to a height of 35 feet. For buildings over 35 feet in height, approval shall be obtained from the administrator, and the board of supervisors. Chimneys, flues, cooling towers, flagpoles, radio or communication towers or their accessory facilities not normally occupied by workmen are excluded from this limitation. Parapet walls are permitted up to four feet above the limited height of the building on which the roof rests.

(Ord. of 12-21-09)

9-7. - Coverage regulations.

Buildings, or groups of buildings, with their accessory buildings may cover up to 60 percent of the area of the lot.

(Ord. of 7-25-91; Ord. of 12-21-09)

9-8. - Sign regulations.

Sign regulations shall conform to article 11 of this ordinance.

(Ord. of 12-21-09)

Appendix 4

Economic Importance of a Marine Railway to the Northern Neck of Virginia

Working Waterfronts Case Study

"Ampro Boat Yard"

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Economic Importance of a Marine Railway to the Northern Neck of Virginia

Working Waterfronts Case Study "Ampro Boat Yard"

September 2015

Thomas J. Murray
Virginia Institute of Marine Science
Virginia Sea Grant-Affiliated Extension

VIMS Marine Resource Report No. 2015-13

VSG-15-07

Additional copies of this publication are available from:

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Cover Photo: Stuart McKenzie, Northern Neck Planning District Commission.

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Marine Advisory Services

Introduction

Ampro Boat Yard, located on the Western Branch of Carter's Creek in Weems, in Lancaster County, Virginia has been repairing fishing vessels and smaller recreational boats for over a century. It was first incorporated as Rappahannock Marine Railway Co. in 1905. Mr. H.R. Humphreys bought into the company in 1912 and reorganized it as "Humphreys Marine Railways and Lumber Corporation," better known as "Humphreys Railways." It became "Ampro Boat Yard" in 1988. Its primary purpose has not altered over time as the yard primarily has provided repairs for menhaden boats, although several large fishing vessels are reported to have been built by the yard as well. In its heyday, during the 1950s and 60s, it is reported that the yard employed upwards of 150 people, making it one of the largest employers in Lancaster County. Until several of years ago, the yard was hauling scallop boats from Seaford, Virginia, finfish draggers from Cape May, New Jersey and smaller menhaden boats known as snapper rigs. And then the rail bed broke. The estimated cost for repair to a rating of 1000 tons is in the neighborhood of 2.5 million dollars. The owner is uncertain that the return will justify that degree of investment. It was estimated that with the repair, a minimum of 25 employees could be hired to sustain the operation. In the meanwhile, local large fish boat operators are having to transit farther from their home ports in order to have work performed on the hull bottoms, and qualified workers are unemployed.

Economic Assessment

Any decision to invest or reinvest in this facility is clearly the owner's and many factors influence such significant reinvestment. Those factors are not to be determined or evaluated by others. The purpose of this exercise is to demonstrate the economic impact of this unique piece of working waterfront, in its current use, to the local community and Lancaster County, Virginia.

Demonstrating the public goods which may arise from privately held working waterfronts is of interest beyond the owners of the property and of ongoing interest to local economic development oriented organizations, both public and private.

This evaluation utilizes traditional regional economic base theory, to define the economic linkages of a working boat yard in the community. Economic impact models are constructed for two primary purposes:

1. To demonstrate the economic size of an industry or activity;
2. To evaluate changes in economic activity of an industry or activity.

This report addresses the second goal. The intent is to "recast" the economic impact of the facility if it returned to historic levels of activity as reflected by the numbers of employees at the facility. As noted above the historic stature of the railway was significant supporting 150 full time workers at the height of its activity. At the other end of the employment picture a minimally sustainable railway operation would create a demand for an estimated 25 employees.

This evaluation investigates the overall economic activity to Lancaster County and the Commonwealth of Virginia associated with differing levels of employment at the facility.

Economic Impact Estimation

The information collected is utilized in estimating the initial economic activities in the Lancaster County economy associated with the Ampro Boat Yard maintenance and repair business. These economic impacts take the form of initial expenditures, economic output, wages, salaries, and employment.

Values for each of these are estimated by employing the IMPLAN model, computer software and Database package designed for regional economic impact analysis in the United States at the county level (Minnesota Implan Group, Inc., 2013). The analytical framework for IMPLAN is the "input-output" economic modeling approach originally described by Leontief (1959). The model utilizes databases consisting of a set of social/economic accounts which describe the structure of the US economy in terms of transactions between households, governments, and over 500 standardized industry sectors classified on the basis of the primary commodity or service produced. This model utilized the IMPLAN economic data package for Lancaster County and the Commonwealth of Virginia.

Regional models may be constructed in IMPLAN for any county, group of counties, state or territory in the United States. Economic impacts for a given region are specified in IMPLAN as a change in final demand, output, or employment for a particular industry sector or social institution, (e.g., households, government). The aggregate economic impact of these changes is calculated by a matrix inversion procedure that develops economic multipliers, which reflect the direct, indirect and induced impacts. Direct, indirect, and induced impacts are set in motion within the County by changes in the supply and demand of boat yard services,

which in turn affects the demand for the goods and services associated with conduct of repair and refitting.

Lancaster County boat yards represent a "basic" industry in that they produce a product for sale outside the local area. Dollars generated through these out-of-county sales (or consumption locally by non-residents), when re-spent in the community, produce additional countywide economic impacts. A "basic" industry directly affects economic activity in the region when its product is sold outside the local area. These *direct* activities produce additional *indirect* effects in the local economy, as dollars earned through the repair of vessels are re-spent locally[1]. Indirect effects represent purchases of local products by repair yards. All the indirect effects are additional economic activity in the community and are indicative of additional jobs and income generated by the boat yard businesses.

Direct and indirect activities associated with boat yards in Lancaster County then produce additional *(induced)* local impacts. These impacts are associated with the spending of income earned in the direct and indirect activities. This spending translates into local retail sales, local bank deposits, and the purchase of a diverse mix of consumer goods. An assessment of the total economic impact of a basic industry, such as Lancaster boat yards, must consider the sum of the direct, indirect, and induced activities. In essence, the local boat yard sales to owners from outside the community trigger a chain of local spending, which generates income and leads to additional spending. This process, however, is not infinite in nature. At each round of spending, for example, some dollars are lost (leaked) from the local economy. Leakages are in the form of savings in non-local institutions, taxes/fees paid to the state and federal governments, and payments for goods and services used in the boat yard activity, which are initially purchased outside the local area. Thus, the true economic impact from non-local sales Dania Cut located businesses is represented by the new dollars remaining after accounting for the various "leaks" in the economy.

Thus, the total economic activities and impacts to the County economy initiated by Ampro Boat Yard activity are estimated. The *direct*, *indirect*, and *induced* effects, are expressed in standard impact terms of economic output (sales), personal incomes, total value added and employment is estimated via the IMPLAN model. The estimates of business activity for 2013-2015 are used.

As the increases in business activity accrue at local businesses the changes spread throughout Lancaster County and the Commonwealth of Virginia as well. In order to capture the multiplication of the direct boat yard impacts an input output model is used here to quantify the growth using various traditional economic impact measures.

The models project the impacts associated with various levels of output at the subject firm or locale. With the Ampro estimates the levels of employment necessary to produce a million dollars of output are the beginning point to project. Associated with those levels of employment are resulting impacts quantified using various established metrics which follow in the tables below and on the next 2 pages.

Table 1 summarizes the changes in labor income associated with the various output and employment levels. Labor income includes all forms of employment compensation, including employee wages and salaries, and proprietor income or profits.

Boat yard sector		Lancaster County, Virginia[2]					
		25 workers	**50 workers**	**75 workers**	**100 workers**	**125 workers**	**150 workers**
Labor Income Impacts	Direct Impacts	$2.7	$5.5	$8.2	$10.9	$13.6	$16.4
	Indirect Impacts	$0.6	$1.1	$1.7	$2.2	$2.8	$3.4
	Induced Impacts	$0.6	$1.1	$1.7	$2.3	$2.9	$3.4
	Total	$3.9	$7.7	$11.6	$15.4	$19.3	$23.2

[1] *See Appendix 1 for a Glossary of Economic Impact modelling definitions.*

[2] *The impacts from the boat yard activities on Lancaster County also multiply throughout the Commonwealth of Virginia. Those summary economic impact tables appear in Appendix 2.*

Table 2 provides the impact estimates on sales associated with the various levels of activity at the boat yard.

Boat yard sector		Lancaster County, Virginia					
		25 workers	**50 workers**	**75 workers**	**100 workers**	**125 workers**	**150 workers**
Output Impacts	Direct Impacts	$8.1	$16.2	$24.3	$32.5	$40.6	$48.7
	Indirect Impacts	$1.5	$3.0	$4.5	$6.0	$7.5	$9.0
	Induced Impacts	$1.9	$3.7	$5.6	$7.5	$9.3	$11.2
	Total	$11.5	$23.0	$34.5	$45.9	$57.4	$68.9

Table 3 provides the impact measurements in terms of "value added." Value added includes wages and salaries, interest, rent, profits, and indirect taxes paid by businesses. In these IMPLAN results tables, Value-added equals the sum of Labor Income, Other Property Type Income, and Indirect Business Taxes. Value added is a key measure and is considered the fundamental measurement of local economic growth.

Boat yard sector		Lancaster County, Virginia					
		25 workers	**50 workers**	**75 workers**	**100 workers**	**125 workers**	**150 workers**
Value Added Impacts	Direct Impacts	$3.1	$6.2	$9.3	$12.5	$15.6	$18.7
	Indirect Impacts	$0.9	$1.7	$2.6	$3.4	$4.3	$5.1
	Induced Impacts	$1.1	$2.2	$3.3	$4.5	$5.6	$6.7
	Total	$5.1	$10.2	$15.3	$20.3	$25.4	$30.5

Table 4 accounts the impacts in terms of business tax collections generated. "Indirect business taxes" include sales, excise, and property taxes as well as fees and licenses paid by businesses during normal operations. It does not include taxes on profits or income.

Boat yard sector		Lancaster County, Virginia					
		25 workers	**50 workers**	**75 workers**	**100 workers**	**125 workers**	**150 workers**
Indirect Business Tax Impacts	Direct Impacts	$0.1	$0.2	$0.2	$0.3	$0.4	$0.5
	Indirect Impacts	$0.1	$0.1	$0.2	$0.2	$0.3	$0.4
	Induced Impacts	$0.1	$0.2	$0.4	$0.5	$0.6	$0.7
	Total	$0.3	$0.5	$0.8	$1.1	$1.3	$1.6

Table 5 provides the total employment impacts at the various levels of activity. Employment or jobs represents the total numbers of wage and salaried employees as well as self-employed jobs. This includes full-time, part-time and seasonal workers measured in annual average jobs.

Boat yard sector		Lancaster County, Virginia					
		25 workers	**50 workers**	**75 workers**	**100 workers**	**125 workers**	**150 workers**
Employment Impacts	Direct Impacts	25	50	75	100	125	150
	Indirect Impacts	11	23	34	45	57	68
	Induced Impacts	17	33	50	67	83	100
	Total	53	106	159	212	265	318

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Kirkley, J. E. and T. J. Murray. 2005. Economic Contributions of Virginia's Commercial Seafood and Recreational Fishing Industries: A User's Manual for Assessing Economic Impacts. VIMS Marine Resource Report No. 2005-9.

Leontief, W. 1959. The problem of quantity and quality in economics. Daedalus, 88(4), 45–57.

Minnesota IMPLAN Group, Inc. 2008. IMPLAN Professional 3.0, Economic Impact and Social Accounting Software and Data. 2010 IMPLAN State Package for Virginia. Stillwater, MN. http://implan.com.

Murray, T. J. and K. Hudson. 2013. Economic Activity Associated with Shellfish Aquaculture in Virginia - 2012. VIMS Marine Resource Report No. 2013-4.

Appendix 1. Glossary of Input-Output Terms

Direct effects/impacts: Direct impacts represent the revenues, value-added, income, or jobs that result directly from an economic activity within the study area or a regional economy.

Employment or Jobs: Represents the total numbers of wage and salaried employees as well as self-employed jobs. This includes full-time, part-time and seasonal workers measured in annual average jobs.

Indirect Business Taxes: Include sales, excise, and property taxes as well as fees and licenses paid by businesses during normal operations. It does not include taxes on profits or income.

Indirect effects/impacts: Indirect effects occur when businesses use revenues originating from outside the region, or study area, to purchase inputs (goods and services) from local suppliers. This secondary, or indirect business, generates additional revenues, income, jobs and taxes for the area economy.

Induced effects/impacts: Induced effects or impacts occur when new dollars, originating from outside the study area, are introduced into the local economy. Induced economic impacts occur as the households of business owners and employees spend their earnings from these enterprises to purchase consumer goods and services from other businesses within the region. This induced effect generates additional revenues, income, jobs and taxes for the area economy.

Input-Output Analysis: The use of input-output models to estimate how revenues or employment for one or more particular industries, businesses or activities in a regional economy impact other businesses and institutions in that region, and the regional as a whole.

Input-Output Models: A mathematical representation of economic activity within a defined region using inter-industry transaction tables or matrices where the outputs of various industries are used as inputs by those same industries and other industries as well.

Labor Income: All forms of employment compensation, including employee wages and salaries, and proprietor income or profits.

Local/ Resident revenues/expenditures: Local revenues or spending represent simple transfers between individuals or businesses within a regional economy. These transactions do not generate economic spin-off or multiplier (indirect and induced) effects.

Margins: Represent the differences between retail, wholesale, distributor and producers prices.

Non-resident /Non-local revenues/expenditures: When outside or new revenues flow into a local economy either from the sale of locally produced goods and services to points outside the study area, or from expenditures by non-local visitors to the study area, additional economic repercussions occur through indirect and induced (multiplier) effects.

Other Property Type Income: Income in the form of rents, royalties, interest, dividends, and corporate profits.

Output: Revenues or sales associated with an industry or economic activity.

Total Impacts: The sum of direct, indirect and induced effects or economic impacts.

Value-added: Includes wages and salaries, interest, rent, profits, and indirect taxes paid by businesses. In the IMPLAN results tables, Value-added equals the sum of Labor Income, Other Property Type Income, and Indirect Business Taxes.

Appendix 2. Economic Impacts to the Commonwealth of Virginia

State of Virginia							
Boat yard sector		**25 workers**	**50 workers**	**75 workers**	**100 workers**	**125 workers**	**150 workers**
Labor Income Impacts	Direct Impacts	$2.7	$5.5	$8.2	$10.9	$13.6	$16.4
	Indirect Impacts	$1.1	$2.2	$3.3	$4.4	$5.5	$6.6
	Induced Impacts	$0.9	$1.8	$2.7	$3.6	$4.5	$5.4
	Total	$4.7	$9.4	$14.2	$18.9	$23.6	$28.3
Indirect Business Tax Impacts	Direct Impacts	$0.1	$0.2	$0.2	$0.3	$0.4	$0.5
	Indirect Impacts	$0.1	$0.2	$0.3	$0.4	$0.5	$0.7
	Induced Impacts	$0.2	$0.4	$0.6	$0.7	$0.9	$1.1
	Total	$0.4	$0.7	$1.1	$1.5	$1.9	$2.2
Other Property Income Impacts	Direct Impacts	$0.3	$0.6	$0.9	$1.2	$1.5	$1.8
	Indirect Impacts	$0.5	$1.1	$1.6	$2.1	$2.7	$3.2
	Induced Impacts	$0.6	$1.2	$1.8	$2.5	$3.1	$3.7
	Total	$1.5	$2.9	$4.4	$5.8	$7.3	$8.7
Total Value Added Impacts	Direct Impacts	$3.1	$6.2	$9.3	$12.5	$15.6	$18.7
	Indirect Impacts	$1.7	$3.5	$5.2	$6.9	$8.7	$10.4
	Induced Impacts	$1.7	$3.4	$5.1	$6.8	$8.5	$10.2
	Total	$6.5	$13.1	$19.6	$26.2	$32.7	$39.3
Output Impacts	Direct Impacts	$8.1	$16.2	$24.3	$32.5	$40.6	$48.7
	Indirect Impacts	$3.1	$6.1	$9.2	$12.3	$15.3	$18.4
	Induced Impacts	$2.9	$5.7	$8.6	$11.4	$14.3	$17.1
	Total	$14.0	$28.1	$42.1	$56.1	$70.1	$84.2
Employment Impacts	Direct Impacts	25	50	75	100	125	150
	Indirect Impacts	17	35	52	69	86	104
	Induced Impacts	22	44	66	88	110	131
	Total	64	128	193	257	321	385

Appendix 5

Case Study of Willis Wharf

Working Waterfront

Zoning and Property Ownership Issues

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Case Study of Willis Wharf Working Waterfront

Zoning and Property Ownership Issues

Accomack-Northampton Planning District Commission, March 2015

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Introduction

In an on-going effort to inform state and local leaders of policy options that support working waterfronts, this study examines the local planning, zoning, and fiscal policies of Willis Wharf on the Eastern Shore of Virginia. The study describes the zoning ordinances; outlines how property is assessed, valued and taxed; whether there are exemptions on tools and machinery; results from interviews with parcel owners in the two key Willis Wharf Waterfront Village zones; possible impediments or threats to maintain, site new, or transfer ownership of working waterfront businesses; and recommendations of working waterfront tools to address the issues of greatest concern to aquaculture industry business owners.

As a working waterfront community, Willis Wharf needs to build capacity in the aquaculture industry and assert its importance as a driver of regional economic development in harmony with nearby waterfront village residences and traditional surrounding agricultural demands and practices.

The case study is based on Northampton County's current Zoning Code regulations[1] and does not consider any proposed amendments to the Northampton County zoning code, currently in process. Information resources for the project derive from the Northampton County website[2] and Northampton County representatives; from direct interviews with Willis Wharf working waterfront business owners; previous working waterfront reports; and from Virginia's State Land Evaluation and Advisory Council (SLEAC) Manual.

History

Willis Wharf, one of the Eastern Shore of Virginia's oldest communities, is an unincorporated village with a population of around 140[3] located in the northern part of Northampton County on the seaside of Virginia's Eastern Shore. According to the Federal Emergency Management Agency (FEMA), most Willis Wharf residences sit at 10 feet above mean sea level whereas working waterfront businesses are located in lower elevations within designated Special Flood Hazard Areas.

Willis Wharf has a long maritime history that has played a key role in how the development has occurred. The village is located on Parting Creek, a navigable tidal channel so named because it separates Northampton County from Accomack County. According to Chad Ballard, owner of Ballard Brothers Fish & Oyster Company, that in his experience, 95 percent of the Commonwealth of Virginia's seed clams are generated from Willis Wharf aquaculture operations[4].

[1] 2009 Northampton County Code, passed October 21, 2009
[2] Northampton County website, www.co.northampton.va.us, 2005-20013 Northampton County, VA
[3] 2010 U.S. Census website, http://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml
[4] Phone Conversation with Chad Ballard, March 19, 2015

Figure 1. Aerial View of Willis Wharf (Google Earth)

Community Planning and County Policy Development

In 1994 the residents of Willis Wharf participated in a community planning session to develop a vision for the future of the community. One predominant theme for the vision was that it is imperative that the community retains and allows working waterfronts to operate along the community's waterfront areas. Residents acknowledged that these uses were vital parts of the community's history and well-being and a plan was developed for how to ensure the sustainability of working waterfronts in the community. The plan was subsequently incorporated into the Northampton County Comprehensive Plan and the County's Zoning Ordinance was amended in 2009 to incorporate land-use policies that carried out the 1994 *Willis Wharf Vision Plan*.

In 2011, Willis Wharf's residents reconvened to update the 1994 plan. Residents participated in two stakeholder meetings to revisit evolving economic, demographic, and land use trends, and to update. In the 2011 *Update of the Visions for the Villages of Willis Wharf and Oyster Summary Report*[5], it was recommended that *Vision* language from 1994 remain largely unchanged. Overall, residents believed the *Vision* served the village well for over a decade, and that its basic goals and principles continued to reflect the desires and needs of the village inhabitants. Residents continued

[5] "Update of the Visions for the Villages of Willis Wharf and Oyster Summary Report – Northampton County, Virginia", prepared by Milton Herd of Herd Planning and Design, and Vlad Gavrilovic, AICP of Renaissance Planning Group, May 16, 2011

to see Willis Wharf as a small, safe, and quietly thriving seaside village that retains its own distinct identity, physically and politically separate from the nearby Town of Exmore. Residents sought to preserve its historically rural, cultural, and natural heritage, while maintaining the quality of ground and surface waters to support residents with ecologically-friendly seafood, farming, ecotourism, and related industries.

The 2011 *Vision* update did recommend that the text of the Northampton County Comprehensive Plan, under Section 2.2.6 (Waterfront Village) be amended to provide greater clarity and guidance for future land uses, structures, and wastewater disposal. Citizen stakeholders wanted to provide an even stronger link between the *Vision* and implementation actions, such as rezoning approvals; use the *Vision* as an opportunity to protect working waterfronts, including aquaculture; and to avoid granting "carte blanche" to waterfront uses.

General Zone Description for Working Waterfront Village Businesses

Northampton County's Zoning Code (Ordinance passed 10/21/2009), defines the Waterfront District Village as:

> *"Waterfront Village District (WV).* The intent of this primary district is to recognize the distinct traditional waterfront villages in Northampton County and to provide for a mixture of residential, commercial, and limited agricultural uses which are compatible in aspect, design, and form with a rural waterfront village setting, designed to preserve environmentally sensitive lands and protect water quality and viewsheds, and serve to support its residents and the local economy with traditional seafood, farming, and related industries that are clean, environmentally low impact, and ecologically sound. Four secondary districts are provided." [NCC Section 154.081 (F)]

The first two secondary districts are described within the Northampton County Zoning Code Section 154.081 as follows:

> ***Waterfront Village-1 (WV-1).*** The intent of this secondary district is to provide for low-density rural housing while recognizing existing agricultural uses and ensuring that farming and other uses and activities protect wetlands and ground and surface waters. [NCC Section 154.081 (F) (1)]
>
> ***Waterfront Village-2 (WV-2).*** The intent of this secondary district is to provide a mix of housing types, with single-family units predominating, that are compatible in scale with the traditional characteristics of the village, and still ensuring that uses and activities protect wetlands and ground and surface waters. [NCC Section 154.081 (F) (2)]

This study focuses on the two following secondary districts identified in the Northampton County Zoning Code which apply to commercial uses:

> ***Waterfront Village – Neighborhood Business (WV-NB).*** The intent of this secondary district is to recognize existing commercial areas and to allow for environmentally low-

impact commercial activities which preserve the pristine quality of ground and surface waters and other natural resources in the village. In addition, mixed-use neighborhood businesses with limited residential development may also be appropriate if impacts from such mixed-use development can be mitigated, while still ensuring that uses and activities protect wetlands and ground and surface waters. [NCC Section 154.081 (F) (3)]

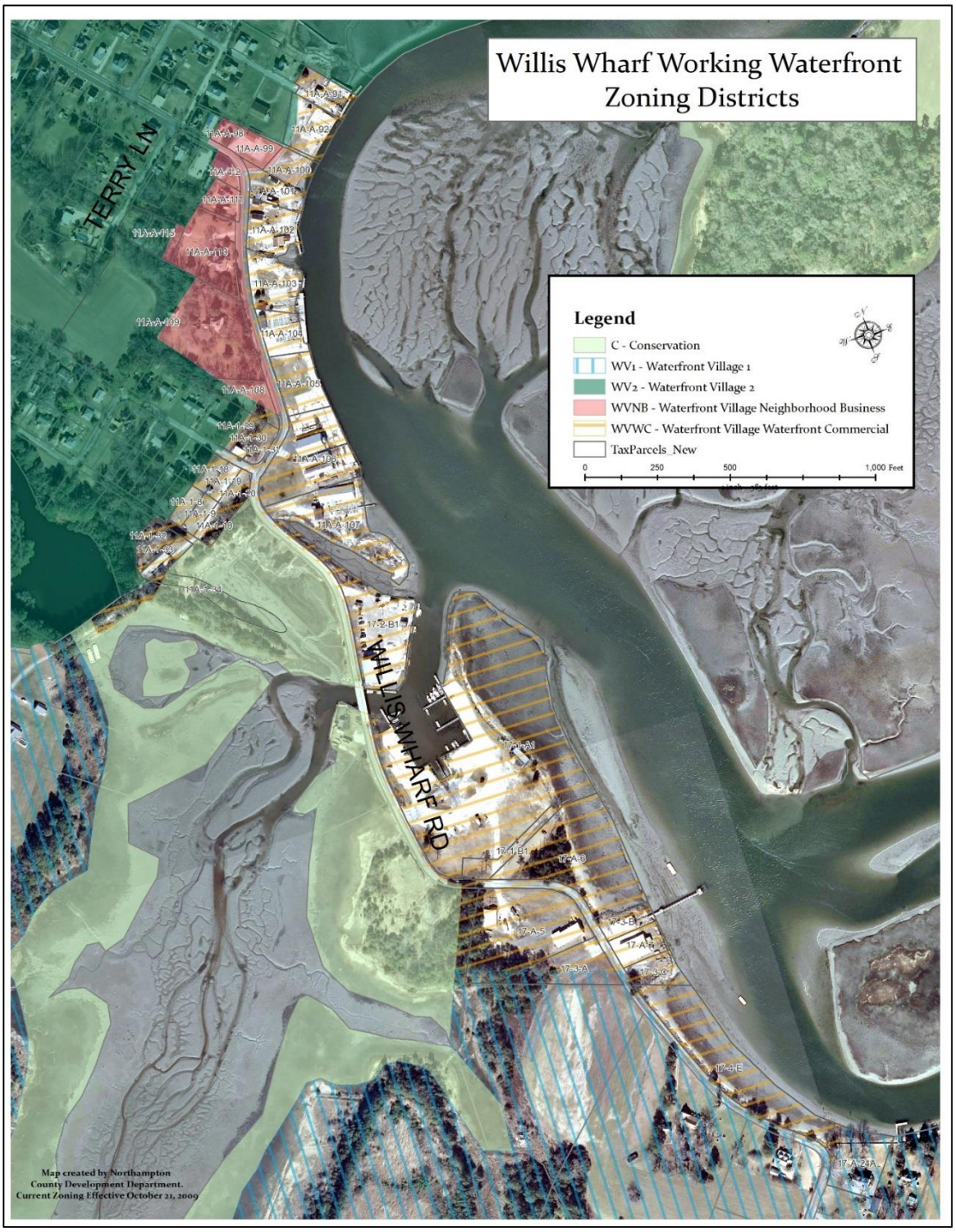

Figure 2. Willis Wharf Working Waterfront Zoning Districts (Northampton County, April 6, 2015)

There are 8 parcels zoned as WV-NB in Willis Wharf (See Appendix A). Three of the parcels contain single-family residences. One parcel contains a restaurant; another hosts an U.S. Post Office; and one parcel is vacant of development. The two remaining parcels have more than one zoning district present. One split parcel has two districts, a narrow area zoned WV-NB adjacent to a WV-2 zone that has a single-family residence on it. The other split parcel has three different zoning designations: WV-2, WV-NB, and WV-WC.

> ***Waterfront Village - Waterfront Commercial (WV-WC)***. The district is to provide for those low-impact commercial uses which must be located on the waterfront due to the intrinsic nature of the activity, while still ensuring that uses and activities protect wetlands and ground and surface waters. .[NCC Section 154.081 (F) (4)]

Of a total 33 WV-WC parcels, 26, or 79% are used commercially. The Northampton County staff indicated that it is not always possible to accurately discern what is vacant and what is used commercially for the WV-WC district. The lots vacant of development are primarily used as staging areas for equipment, boats, and other necessary commercial business activities, or are used for access to commercial buildings on adjacent parcels.

Northampton County owns and operates a public harbor within the WV-WC district with 50 boat slips, sanitary facilities and power availability. Portions of the harbor parcel are vacant. The harbor is overseen by a Harbormaster and the Willis Wharf Harbor Committee. This committee formalizes communication between Willis Wharf and the county government, oversees construction of harbor improvements, provides recommendations to the County Board of Supervisors for use of the facility, and develops the fee schedule and operating procedures. Along with the harbor parcel, Northampton County owns other parcels including a sizable parcel across from the harbor that is a former public green box waste collection site that is currently vacant.

The Chesapeake Bay Preservation Act, aimed at reducing nonpoint source pollution, was enacted by the Virginia General Assembly in 1988 to establish cooperative relationships between the Commonwealth and local governments to protect the water quality of the Chesapeake Bay. Northampton County adopted a zoning overlay district known as the Chesapeake Bay/Atlantic Preservation District (CAP) to make county zoning water quality protection measures consistent with the state's that extend and apply protection regulations on all seaside areas in the County.

One WV-WC property owner cited Northampton County's enforcement of CAP as providing a "great benefit of protecting water quality on the seaside". Although the CAP's buffer regulations could potentially adversely affect WV-WC property owners by imposing building restrictions, none of the owners remarked on this provision.

Transferability

Transferability, or the ease with which it is possible to continue a specific use when and if ownership changes, is key to maintaining working waterfronts and preventing their gradual disappearance by being supplanted by waterfront homes or other non-waterfront-dependent businesses. The Willis Wharf community's unified *Vision* seeks to provide an industry-supportive

road map for decisions about waterfront land, infrastructure, use inventories, and assessments that preserve working waterfronts.

One owner interviewed recalled encountering an issue regarding the size of the parcel when he wanted to subdivide and sell to another aquaculture business. He was required to obtain a special permit and to conduct a study in order to complete the sale. The extra "hoops" that this seller needed to jump through represent a potential threat to the legacy of working waterfronts. Had the seller decided not to spend the money and time to obtain the permit and conduct the study, the property could have been sold to the highest bidder for conversion into waterfront homes, resulting in the loss of a historically commercial working waterfront site.

The only WV-NB property owner interviewed indicated that he sold his property over a year ago to an aquaculture business that plans to build a structure to spawn oysters. He sold the property with lifetime rights and had no issues with ownership transfer. The owner had used the property to store crab pots, did not have tax exemptions that he was aware of, and he encountered no zoning policy barriers to transact the sale.

Zoning and Assessment Policies

A review of Northampton County's zoning and assessment policies is included to examine their effect on whether and how they are consistent with Willis Wharf's *Vision* to remain a thriving seaside village that works cooperatively with its neighbors to:

- Determine its own destiny and retain its distinct identity;
- Preserve its rich natural and cultural heritage and affordable residential neighborhoods;
- Maintain the pristine quality of the ground and surface waters and other natural resources in and around the community as an integral part of the daily life and the local economy;
- Support and retain its residents with seafood, farming and related industries that are clean, low-key, and ecologically friendly;
- Grow gradually, while still preserving and enhancing the traditional village character and surrounding rural open space through well-planned, managed, and compatible development.

Zoning Use Regulations for WV-NB and WV-WC

Northampton County's standards for lot coverage and open space preservation in both zones are intended to preserve the rural character and support the agricultural, seafood, and tourist industries, while conserving the County's natural resources. The rest of the land is to be set aside and maintained as open space. The standard for lot coverage in both zones is 60%.

By-right and special uses within these zones are summarized in Appendix B. Working waterfront uses fall into both categories. In Northampton County, application for an approved zoning clearance is required to change the use of land or structures, or to alter or build structures. The current zoning clearance application is fifty pages in length but applicants can start the process by filling out two pages, submitting a completed checklist and payment of the fee. If land disturbance occurs or the use is a special use, additional sections then must be completed. Impacts to stream and bay buffer areas also cause additional sections to apply. The

County considers listed special uses as compatible with the surrounding district but requires an individual review of the application, a public hearing and approval by the Board of Supervisors. Special use permits may also impose requirements and conditions. The special use permit indicates whether it is issued to the individual applicant or whether it is issued for use on the site and runs with the land. One property owner interviewed cited extreme dissatisfaction with the process and length of time required to acquire the necessary permits to expand his business operations. Another mentioned needing a permit and a study to finalize a sale.

Assessment Policies for WV-NB and WV-WC Zones

All property in Northampton County is assessed at its highest and best use. The County Assessor is guided by established, uniform standards and principles set forth by the International Association of Assessing Officers and requirements under the Code of Virginia. Assessments are made based on arm's-length transactions that occur during a specified marketing time period. All assessments are made at 100% fair market value.

Some properties are eligible for tax relief if they qualify for certain programs offered by the county. The SLEAC determines and publishes yearly ranges of suggested values for several classes of agricultural, horticultural, forest, and open space land in the localities that have such a program. Northampton County has two such programs: Agricultural and Forest Districts, and Preservation Easements. The local assessing officer uses these SLEAC values to arrive at the official use-value assessment of any qualifying parcel of land. Northampton County does not have a use value assessment unless it is within an Agricultural Forestal District (AFD) or a Preservation Easement. The Northampton County Assessor stated that "none of Willis Wharf is in an AFD, and no parcels would be included in it if they were". Eligibility requirements for use value assessments appear to eliminate most, if not all, Willis Wharf parcels.

Other programs endorsed by Northampton County, such as Handicapped and Elderly Relief and Veterans Relief, may qualify a property to be tax-free, although the property's assessment remains at 100% of fair market value.

Many places that are residential on the water but in a different zoning category other than residential are grandfathered, and the highest and best use would still be considered residential. However, if such residential structures were torn down and replaced by commercial businesses, the highest and best use would change, as would their corresponding assessments. Increased assessment valuation is a significant concern expressed by survey participants.

Exemptions to, or Capital Taxes on, Tools and Machinery

Aquaculture businesses were classified as "agriculture" under Virginia State Code Section 3.2-300, and therefore enjoy the same tax breaks on tools and machinery as agricultural businesses. One of the waterfront commercial business owners interviewed stated that he gets tax exemptions on gas and diesel fuel, but was not aware of county tax exemptions. Another business owner stated she enjoys the same tax break as agriculture.

Maintaining a Commercial Water Dependent Industry or Future Siting

Zoning designation can increase a property's assessment but does not do so in all cases. A zoning change does not necessarily mean the assessment automatically changes unless the

market sales after the zoning change warrant a change in market value. Maintaining a zoning change designation that allows waterfront use supports the industry and allows expansion.

Challenges Cited by Owners

Willis Wharf property owners did not express problems with the local zoning framework for ownership transfer. Water-dependent business owners generally expressed confidence, or "no issues", in being able to sell to another waterfront business when asked "Is there a potential threat to current use if ownership is transferred?" However, one waterfront business owner indicated that he had to acquire a special use permit and conduct a study. Another owner stated, "We are pretty well protected, no matter what zoning, but it's what Exmore, Accomack, and Northampton do that affects us. We never and can't know what they are going to do and plan ahead."

Another business owner did indicate "nervousness about Northampton County's possible desire to zone working waterfront 'off-land', including zoning parts of the water", and hoped to "avoid valuation" in order to be able to remain on the water. The nervousness bespoke awareness that increases in property values and taxes could adversely impact water-dependent businesses.

One owner expressed extreme frustration, stating that the costs exacted in dollars and long advance time (18-24 months) to navigate through Northampton County's permitting processes when trying to expand waterfront business operations are prohibitive and make it "almost not worth it". He said that if he needed to add on, he would need to spend 2-4 hours per day to work on permits over the course of "probably 18 months". A different owner recounted, however, that he is able to deal with the county effectively and nothing in the past impeded his ability to expand operations.

Another challenge voiced by two Willis Wharf WV-WC property owners is the threat from sea level rise. One owner said global warming, tidal rise and barrier island changes to the landscape are a major concern. A second owner worried that increasingly vigorous storms and damaging flooding could wipe out aquaculture operations.

A consistent refrain from the WV-WC owners when asked "What policy actions would you like to see your responsible leaders become aware of?" did not relate to zoning or assessment concerns, but rather to water quality. Owners cited concerns regarding degraded water quality from storm water runoff into the watershed from new developments with 100+ septic systems; overflow problems associated with the Town of Exmore's waste treatment system; and from agriculture, especially poultry farms and farms that use plastic to plant crops.

Aquaculture farmers feel as though they are in "tough going" competition with agriculture farmers. One aquaculture farmer said, that the most helpful policy tool is whatever protects water quality. "Our business won't exist if the water quality around Accomack and Northampton Counties continues to decline," he added.

The Willis Wharf owners, citing water quality issues, suggested policy requests to make sure farmers use best management practices (e.g., buffers along streams, cover crops, storm water ponds), that prevent chemicals used on crops from reaching perennial streams and receiving waters and contaminating clam and oyster beds.

Themes and "Toolbox" Planning Recommendations

The following section describes common themes encountered among issues described by working waterfront property owners and provides planning and policy tool recommendations that may be of use towards resolving the identified issues and protect and enhance working waterfronts in Willis Wharf.

Themes

Based on interviews with Willis Wharf property owners in zones WV-NB and WV-WC and their comments noted in the table below, the following recurrent themes and pertinent concerns emerged and are presented in no particular order:

- Need to make clear distinctions about aquaculture industry's needs in relation to agriculture and residential development;
- Need recognition of the value of protecting and enhancing the historic working waterfront culture as a valuable asset for the region's economic development;
- Working waterfront business owners and local government need to work together to streamline permitting processes to save owners' time and money, increase profitability; and
- Need legal and policy tools in place to anticipate and accommodate emerging business and climate change models.

The Willis Wharf owners' responses are consistent with recommendations and refinements made by Willis Wharf stakeholders in the 2011 updated *Vision*. Regarding waterfront village land uses, stakeholders in the 2011 *Vision* said that working waterfront areas should continue to support water-dependent industries, and that any new development that would be detrimental to water quality in the areas used by aquaculture need to be discouraged. Stakeholders also noted that rezoning to allow higher density or intensity uses at the edge of Waterfront Villages is not recommended unless it met stringent and compatible criteria on building style and characteristics, and road and utility infrastructure.

Table of Owners' Interview Responses and Recurrent Themes

Parcel Owner	How Taxed, Assessed	Transferability	Tax on Tools or Machinery	Perceived Exemptions Enjoyed	Requested Policy Actions	Other Concerns Mentioned
WV-NB*	Did not ask or know	No issues with ownership transfer	Stored crab pots	Did not have tax exemptions	No policy actions requested	12-foot ROW for public road
WV-WC-1	Did not know current assessment or tax	Past issue sub-dividing parcel sale to another aquaculture co.; Special permit, study to complete sale	Not sure what tools and machinery tax is compared to others	Does not believe enjoys any	Help make sure development is ecologically responsible; prevent manure, agriculture run-off	Continuing to allow irresponsible agriculture practices that degrade water quality
WV-WC-2	Did not state specifically taxes, but is nervous about County's desire to zone aquaculture off-land, in-cluding parts of the water	No experience with transferring property through sale	Is taxed similarly to agriculture	Enjoys most of the exemptions that agriculture enjoys	Make sure leaders pay attention to water quality	Wants ability to be able to stay on water, avoid valuation; Important to keep working waterfronts historically involved in aquaculture
WV-WC-3	Pays property tax on boats, outboards, baskets	Does not perceive any problems with selling to another waterfront business	Gets letter from County to specify tools (hammer, saw & drill bits) but ignores and is charged $10	No comments recorded	Wishes property was zoned as aquaculture; streamline costly expansion permitting (lost operations, numerous studies, permits) process and make it a one-stop shop	Time-consuming, costly permitting process makes it "almost not worth it"
WV-WC-4	Not aware which zone property is in or how taxed; No effect of zoning code regulations; Pretty well-protected, no matter what zoning	Nothing threatens ability to remain	Not aware of County tax exemptions on tools and machinery	Tax exemptions on gas and diesel fuel; enjoys state agricultural tax exemptions	"Whatever protects water quality; County needs to control storm water systems to work properly; Enforce Agriculture BMP's used to control chem. run-off; Best thing is for County to "leave us alone"	Comfortable with CAP, The Nature Conservancy controlling easements; Primary interest: H2O quality; Leary of: Exmore's waste treatment system, residential development, and sea level rise.

** Sold property 1 year ago to P.D. Terry associate who is building a structure to spawn oysters*

Figure 3. Table of Owners' Responses and Recurrent Themes

Stakeholders also reemphasized that any new development should be supported by on-site water and wastewater systems that won't exceed the capacities of existing natural resources and infrastructure. Stakeholders added that any new uses and facilities proposed need to support the goals and functions of the waterfront villages; Northampton County needs to cooperate with Accomack County to the north to limit the impact of new uses and facilities; and Northampton County should support and encourage the use of low-impact storm water management techniques.

Working Waterfront Toolbox Recommendations

The owners were not specifically questioned about tools they might find useful from the working waterfront toolkit. Some proactive leadership tools already exist to help Virginia's coastal working waterfronts such as the Coastal Virginia Working Waterfront Coalition and local fishermen's groups. Based on the combination of owners' responses to the questions posed in this study, and on the recommendations and reiterations expressed in the 2011 *Vision*, the following selection of tools may be applicable to address the owners' needs and concerns:

Leadership and Zoning and Policies

- Create a local working waterfront committee of local business owners and decision-makers, or engage an existing group to identify potential financing tools and descriptions of law and policy tools to increase capacity for preserving working waterfronts;
- Develop a master plan for County-owned property in Willis Wharf with input from commercial waterman that identifies industry needs and strategies for meeting current needs;
- Streamline expansion or start-up permitting processes (one-stop-shop, if possible) to help owners cut costs and save time while still complying with zoning regulations.

Review

- Coordinate stakeholder meetings to update the waterfront village *Vision* regularly (every three to four years) to monitor rapid changes in business, climate, and government zoning;
- Strategize methods, mechanisms to be proactive and respond to changes in state, local, economic growth policies to manage and develop working waterfronts;
- Monitor and provide comments in development and environmental reviews to assure adherence to state and local standards and effective coastal zone management.

Technical and Financial Assistance

- Conduct economic research and analyses to bolster support for and underscore the importance of Willis Wharf's aquaculture industry productivity statewide and East Coast-wide;
- Solicit funding to support studies of potential impacts of sea level rise and climate change on working waterfronts, ways to mitigate effects, and fend-off and recover from damages;

- Request grant support to establish a one-stop-shop permitting process for Northampton County to assist and provide streamlined support to working waterfront business owners.

Outreach

- Approach local working waterfront, seafood, and tourism/trail organizations to create waterfront events that highlight Willis Wharf's maritime history and culture.

Conclusion

This study examined the planning, zoning, and fiscal policies of Willis Wharf, Virginia with the purpose of informing state and local leaders how best to support, protect, and preserve working waterfronts. The methodology included a review of zoning ordinances, assessment methods, taxes and exemptions; potential impediments and/or threats to site new or transfer ownership; interviews with Northampton County representatives and parcels owners in Willis Wharf; and recommendations of tools to address the issues of concern expressed by the aquaculture business owners.

Willis Wharf stakeholders originally set a *Vision* to sustain gradual growth and preserve the village's working waterfront culture and ambiance in 1994, then updated their *Vision* in 2011, to stipulate that zoning, tax assessments, and any proposed residential and infrastructure development conform to their adopted *Vision* plan.

Four owners of Willis Wharf aquaculture businesses were interviewed to solicit their views and experiences with state and county tax and zoning policies and exemptions, transferability. They did not express significant problems with transferability or tax and zoning issues. Their most pressing concerns were potential residential encroachment; the potential effects to their operations of sea level rise; potential contamination of their clam and oyster beds from inadequate or overwhelmed waste water treatment systems and agricultural/storm water run-off; and shortening Northampton County's costly, time-consuming permitting processes. Three of four commercial aquaculture owners interviewed stressed the prime importance of water quality to their continued operations stating, "The health of the (aquaculture) industry depends on water quality", and recommended leaders establish policies to address water quality concerns. When it comes to maintaining or expanding Virginia's aquaculture industry, it was expressed that Virginia cannot afford to allow Willis Wharf to cease its working waterfront operations.

The input received from Willis Wharf property owners was synthesized with the outcomes of the assessment of current County zoning and tax policies to present recommendations for planning and policy tools that are expected to assist with protecting and enhancing working waterfronts to the benefit of both Northampton County and working waterfront businesses. Recommendations included options related to leadership and zoning policies, regular review to monitor regulatory and industry-related changes, options for technical and financial assistance, and outreach. Specifically, it is recommended that Willis Wharf property owners continue to work with Northampton County on a regular basis to continue the planning process that has been in place since 1994. This process has resulted in the implementation of measures that have ensured the longevity of working waterfront businesses in Willis Wharf. Furthermore, it is recommended that additional assessments

and plans be developed with input from Willis Wharf property owners and the Willis Wharf Harbor Committee to maximize the benefit and value of parcels owned by Northampton County to ensure adequate access to the water and to adequately meet the needs of working waterfront businesses. Finally, there are fiscal policy tools available that that could potentially be used by Northampton County to meet future needs of the growing waterfront industry and ensure that waterfront infrastructure is adequately maintained for years to come. It is recommended that Northampton County consider these tools as a means of ensuring the longevity and productivity of working waterfront businesses in Willis Wharf.

Appendix A

Willis Wharf Companies in Waterfront Village Zones: Waterfront Village Neighborhood Business (WV-NB) and Waterfront Village-Waterfront Commercial (WV-WC)

Willis Wharf Companies in WV-NB: Willis Wharf companies assigned to this zone category are:

1. Samuel D. Stewart Revocable Living Trust (Single Family Home)
2. Thomas Drummond Cropper Walker (Single Family Home)
3. FDI Postal Properties Inc. (U.S. Post Office)
4. Charles D. Perzynski (Single Family Home)
5. Patricia B. Georgiana (Single Family Home)
6. STM/TNC LLC* (Sold to Pete Terry)
7. Randy M. and Pamela T. Widgeon (Restaurant)
8. Hayden Branded Gordon (Single Family Home)

Willis Wharf Parcel Owners in WV-WC:

1. APF LLC (Commercial building, storage room, office, cold storage, open loading platforms, Several empty parcel lots and one with dock/pier, clam house)
2. J. C. Walker Bros. Inc. (Office, docks/piers, clam house, 2,400 sq. ft. concrete for clams, commercial buildings, storage rooms, lean-to, pole shelter, empty parcels)
3. Ballard Fish & Oyster Co.* (Greenhouse-commercial, storage, Dock/pier)
4. Ballard Bros. Fish Co. (Commercial building, office, concrete slab with troughs, metal building, shop, warehouse, empty lot, marsh)
5. The Constance France Bowen Revocable (No building, dock/pier, 2,400 sq. ft. concrete slab for clams)
6. James A. Kelly, IV* (Single family home, garage, clam house, storage lean-to, dock/pier)
7. Henry M. Terry Co.* (Bulkhead, deck for troughs)
8. N. Wescott Terry, Jr. & Greta (Marsh, non-buildable)
9. Kenneth S. & Anne E. Terry, Pete Terry* (Single family home, bulkhead)
10. Northampton County Board of Supervisors (three empty parcels)
11. STM/TNC LLC c/o APF LLC
12. Parting Creek LLC (No building, storage, old dwelling/old office)

Appendix B

Waterfront Village Zones By-Right and Conditional Uses

Agricultural Uses – Permitted "By right"

WV-WC	WV-NB	WV-NB and WV-WC
	Vegetable, grain, production	Agricultural education, demos
	Event venue, (e.g. weddings,, receptions	Bike trails, rentals, hiking trails
		Produce stands, sales
		Fishing
		Kayak/canoe rentals, tours
		Sales, Agriculture-related handcrafts, food products, gifts
		Wildlife viewing, photography
		Winery and winery tours

Agricultural Uses – Conditional

WV-WC	WV-NB	WV-NB and WV-WC
Agriculture research facility	Agriculture research facility	Agri-tourism special events
Agriculture museum	Greenhouse sales	Camps, day or overnight
Event venue, weddings	Landscape design, maintenance	Festivals, fairs
		Guest ranch/lodge up to 12 rooms
	Livestock, domestic use	Hunting
	Horseback riding	

Commercial/Community/Industrial Uses - Permitted "By right"

WV-WC	WV-NB	WV-NB and WV-WC
	Daycare, adult and child, up to 6 persons	Bicycle rentals/sales, services
	Aerobic, dance, day spa	*Plein aire* events
	Antique shops	Temporary seasonal sales, e.g., Christmas trees, seafood
	Appliance, electrical repair	Public utility, Class A
	Art studios up to 2,500 ft^2	Solar energy facility, small system
	Barber shop	Wind turbine, windmill <35f
	Bed and breakfast	Reclamation of soil or water
	Catering, off-premise	
	Domestic animal training	
	Furniture repair, restoration	
	Glass works, jewelry ceramics	
	Guide outfitter services	
	Home or professional office business	
	Moped rentals, sale	
	Shoe repair	
	Veterinary services, no overnight	
	Library	
	Museum	

Commercial/Community/Industrial Uses – Conditional

WV-WC	WV-NB	WV-NB and WV-WC
Dance hall, up to 3,000 sq. ft.	Art studios >2,500 ft^2	Historic inn, pre-1950 structure
Guide/outfitter services	Auction market	Restaurant, waterfront service, < 2,500 ft^2, no drive thru
Schools, vocational, technical, public or private	Conference/retreat center	Schools of special instruction
	Convenience store	Alternate waste water treatment system
	Health club/fitness center	Public utility, Class B
	Motel, hotel, up to 10 rooms	Boat building and repair
	Music studio	Boat/yacht interiors, new, retrofit
	Commercial, retail establishment, up to 5,000 ft^2	Foundry-Artisan up to 2,500 ft^2
	Clothing, furniture manufacture	Storage of seafood products
	Contractor office	
	Landscape contractor, design, maintenance, on-site	
	Plumbing repair shop	
	Restaurant	
	Specialty food production	
	Microbrewery	
	Metal fabrication and welding	
	Recycling collections, $\leq$ 1 acre	
	Taxidermy services	
	Tourism info office, kiosk or staffed	
	Veterinary clinic, goods/ services	
	Church	
	Community center	
	Medical clinic	
	Residential care facility for medical/mental patients	
	Social, fraternal meeting facilities, u to 5,000 ft^2	
	Sewage treatment facilities	
	Wind turbines, windmills, small > 35 and $\leq$199 ft.	

Marine-Related and Recreational Uses - Permitted "By right"

WV-WC	WV-NB	WV-NB and WV-WC
Crab packing houses	Non-motorized watercraft, instruction, rental sales	Aquaculture business office,
Fish packing	Playgrounds for children	Boat ramp for recreational boats, private
Watch houses for shellfish grounds, <500 ft^2	Tennis court, private	Clam packing houses, no processing
Wholesale outlet for clam, fish, crab, 2,500-5,000 ft^2		Crab shedding, enclosed or not
		Docks, private, recreational
		Erosion, storm water control

		L:anding site for finfish, shellfish, crabs
		Marine navigation aids
		Oyster shucking house
		Pot production for crab or eel pots
		Retail sales of fish, clam, crab
		Temporary recreational event, less than 3 days
		Wholesale outlet for clam, fish, crab, <2,500 ft^2
		Wildlife/marine life preservation area

Marine-Related and Recreational Uses – Conditional

WV-WC	**WV-NB**	**WV-NB and WV-WC**
Aquaculture fish production, tanks	Beaches, naturally occurring	Aquaculture fish production in existing ponds
Non-motorized watercraft instruction rental, sales	Crab, fish packing houses	Aquaculture research facility
	Watch houses for shellfish grounds, <500 ft^2	Aquaculture shellfish seed production
	Wholesale outlet for unprocessed clam, crab, fish 2,500-5,000 ft^2	Boat building and repair
	Day camp	Boat ramp for recreational boats, public, commercial with goods, services
	Horse barn	Boat sales, rentals, goods/services
	Swimming pool, public or commercial	Boat storage and washing facilities
	Tennis courts, public or commercial	Fishing pier, commercial or private
	Theater, indoor screen/stage up to 5,000 ft^2	Marina, < 50 slips, public or commercial
		Non-motorized recreational trail
		Parks, public
		Research facilities for marine sciences

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Appendix 6

Economic Activity Associated with Commercial Fisheries and Shellfish Aquaculture in Northampton County, Virginia

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Economic Activity Associated with Commercial Fisheries and Shellfish Aquaculture in Northampton County, Virginia

October 2014

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Virginia Sea Grant-Affiliated Extension

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Virginia Institute of Marine Science
Marine Advisory Services

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Executive Summary

Northampton County shellfish farms sold over $36.7 million worth of cultured clams and oysters during 2013. At the same time the county's commercial fishermen landed over $5.7 million in wild caught finfish and shellfish. Taken together, Northampton County's aquatic harvesters unloaded $42,496,494 of seafood products across the county's waterfronts.

With those sales begins an expansion of the county's economy generating additional growth and economic impacts on households, businesses, and government. As depicted in the table below, the initial farm sales and wild harvests multiply providing economic growth throughout the community. The resulting total impact during 2013 is estimated to have been $97.4 million in output supporting 987 jobs which generated household and business incomes of $27.1 million.

Continued access to high quality growing waters and important offshore fishing grounds is critical to maintaining the economic base which has developed to support this important industry and continue its export base for the county's future economic development.

Total Economic Impact of Shellfish Aquaculture and Commercial Fishing in Northampton County, Virginia - 2013

	Aquaculture	Commercial Fishing	Total
Output ($ millions)	$90.8	$6.6	$97.4
Employment (fte)	817	170	987
Income ($ millions)	$25.6	$1.5	$27.1

Introduction

The growth of the commercial shellfish aquaculture industry in Northampton County has added significant value to the Virginia's seafood marketplace. Today, watermen continue to harvest finfish and shellfish from public resources while, at the same time, shellfish growers are providing additional vast quantities of quality clams and oysters seafood to consumers.

This study was completed to assess the current state of commercial fishery and aquaculture industries in Northampton County and to estimate the economic activity that arises from these enterprises. Central to the continued success of this industry are both water quality and water access for these diverse water dependent industries. This report documents the current economic activity enabled due to access provided by Northampton County working waterfronts to Virginia's waters.

Background

Commercial fisheries have historically been an important economic sector in Northampton County and Virginia. Primarily, fisheries have been based upon wild stocks of fish and shellfish. In relatively recent years there has been increased investment and output in the business of culturing aquatic products. Indeed culture techniques were employed extensively in the historic oyster industry prior to endemic diseases destroying the bulk of the wild oyster resource. Today hard clam and oyster aquaculture are widespread in Northampton County, and increasing technical expertise and infrastructure provide a proven basis for future economic growth.

This growth of the shellfish aquaculture industry in Northampton County has added immense value to the Virginia's seafood marketplace. Hard clams and oysters are grown in Northampton County on coastal submerged lands leased from the Commonwealth of Virginia. As with other forms of shellfish aquaculture, successful oyster and clam farming depends on water quality, free from bacterial and industrial contamination.

1 These values are at first sale, either "farm gate" or exvessel, and do not represent the significant value-added brought into the county by virtue of the export of the majority of this harvest outside the county and the Commonwealth of Virginia.

Generally the three steps of production include the seed production, nursery, and grow-out, and Northampton County is leading the way in hatchery production, nursery techniques, and controlled grow-out. Seed production occurs in land-based hatcheries. Brood stock oysters and clams are spawned in a controlled, indoor environment. Hatcheries are relatively capital intensive. The spawned juvenile clams and oysters are kept in the hatchery until they reach a size where they can be transferred to a land based or other nursery area. There are six active private hatcheries in Northampton County. While this production was typical of clam aquaculture initially, more recently the oyster aquaculture industry has diversified in much the same way.

Methodology

This study was completed to utilize data collected from shellfish growers and seafood harvesters in an effort to benchmark the extent of the industry and estimate its economic linkages and impact to the county and the Commonwealth of Virginia. The impact analysis section below further details the regional economic modeling that translated the direct farm level activity to local and regional economies. Appendix 1 provides a glossary of regional economic impact assessment terminology.

Survey

Since 2006, the author has conducted annual shellfish industry aquaculture crop reporting surveys resulting in the annual report entitled "Virginia Shellfish Aquaculture Situation & Outlook Report" based upon an annual survey of licensed commercial shellfish growers. A mail and internet-based survey is used to collect information from Virginia commercial clam and oyster growers known to be active in the industry. It is believed that the survey is representative of overall trends and reflects the majority of active commercial growers. For confidentiality reasons, the information collected is aggregated and the total represents both the eastern and western shores of Virginia. To demonstrate the most current economic activity in Northampton County a special survey was sent to shellfish aquaculture firms located in the County and a special data request provided data from the Virginia Marine Resources Commission for the wild harvest commercial fisheries unloading in the county.

Findings from these surveys found that Northampton County shellfish farms sold over $36.7 million in clams and oysters during 2013. At the same time the county's commercial fishermen unloaded over $5.7 million in wild caught finfish and shellfish. Taken together the county's aquatic harvesters unloaded $42,496,494 of seafood products across the county's waterfronts.

Overall clam and oyster sales bring economic growth to the eastern shore and the State as growers report that 86% of shellfish cultured locally are sold to out of State buyers. Not only does the seafood industry contribute in terms of employment and sales of products, it produces greater economic benefit to Virginia because of the economic activity it generates through inputs to the shellfish culture and commercial fishery firms.

The economic base multipliers for shellfish aquaculture and commercial fisheries are broadened by the fact that much of the grow-out capital and fabrication is locally completed adding significant value to the local economy as well.

In addition to this direct impact, employees within the aquatic harvest industry generate economic activity when they spend their income on housing, food, and other goods and services. In this way the economic benefits resulting from aquaculture and fisheries extend beyond the local culture to the general Virginia economy.

Economic Impact Analysis

Economic impact analysis begins with introducing a change in the output of goods and using the multiplier model to analyze the effects on a region's economic base. The standard input-output model estimates the direct, indirect, and induced economic implications of some basic economic activity. The secondary effects (the indirect and induced impacts) and the

1 These values are at first sale. Either "farm gate" or exvessel and do not represent the significant value-added brought into Northampton County by virtue of the export of the majority of this harvest outside the County and the Commonwealth of Virginia.
2 VMRC Plans & Statistics Data Report for Northampton County, May 2014.

basic economic activity estimates provide an estimate of the multiplier effects from the basic activity (direct impact).

In the standard input-output model, measures of aggregate economic activity are used as a basis for estimating the total economic impact of the subject activity. For example, measures of direct employment or total sales in an industry are obtained, and these are then used as a basis for evaluating the total impact. In these report estimates of initial fish and shellfish sales by Northampton firms were obtained and used as the base measure for estimating the direct economic impact of the industry.

Given this measure of the direct purchases of the shellfish farming and commercial fisheries-related industry, an estimate is made of the indirect impacts using information on the interactions between these industry sectors and other economic sectors which are, to varying extent, dependent upon the aquatic harvest industries.

For example, suppliers of materials into the shellfish and fishery products transportation, storage, marketing, and distribution are also dependent upon the sales of fish and shellfish. These added sales or impacts are referred to as indirect impacts. Such indirectly dependent sectors include hundreds of other types of manufacturing, trade, for which industrial classifications range from Freight & Shipping to Containers & Packaging.

Ultimately, direct sales activity and resulting indirect activity generate some increases in employment and income in Northampton County and throughout the state. The extra income generated in this way leads to a third wave of economic impact through greater household expenditures on goods and services. Much of this additional re-spending will also occur within the local area, further expanding economic activity. These effects are referred to as the induced impacts of the industry.

Economic Input-Output Model Application

Most regional input-output studies attempt to characterize either, the economic impacts of specified changes in final demand for a given set of products, services, and industries, or the economic significance of specific industries in a regional and national economy. The research described herein accomplishes the latter task, assessing the economic significance of the shellfish farming upon related industries located in Northampton County and the Commonwealth of Virginia.

Because of the interrelationships among the many sectors of an economy, any new basic economic activity, such as increasing clam and oyster sales to out-of-county buyers, will generate additional waves of economic impact. By stimulating the expenditures by out-of-region customers for the export sale of marine products, the seafood production sectors initiate such expanding rounds of economic impact. These impacts first occur within Northampton communities and then throughout the state.

For example, the export marketing of seafood products from the County and Virginia calls forth additional activity among the suppliers of necessary inputs as well as among distributors of seafood related products, warehouses, and retailers. The impact of the sale of a dollar of aquaculture and fishery related goods and services, generates activity not only for the retail sector, but also indirectly generates economic activity for suppliers, accountants, and programmers whose employment supports the operation of the retail enterprise. In an analogous way, the activities of seafood-related marketers and consumers will generate multiple rounds of economic activity.

As mentioned above, economic impact analysis is an attempt to provide an estimate of the total impact of any economic activity in any region, including, not only the primary economic impact, but also secondary and tertiary impacts.

The IMPLAN Model

Many economic impact studies use information from the Regional Inter-industry Impact Model – (IMPLAN 2008). This model was developed using a combination of direct survey data obtained through national surveys of inter-industry interaction, and then shares down the inter-industry relationships to the local or regional level, based upon the structure or employment structure of industries in the state or region. The IMPLAN model used herein includes industry linkages specific to Northampton County and the Commonwealth of Virginia.

From these government derived regional inter-industry relationships, output, income, and employment multipliers are

estimated. Thus, in terms of simple analysis of the aggregate impacts of activity on the regional economy, published government estimates of the multiplier are used. The use of the IMPLAN multipliers for the present analysis is considered reasonable.

To perform the impact analysis, initial information on the level of primary or basic economic activity for the industry studied is needed. As mentioned above, measuring the total economic impact of any product, good, or service first requires an estimate of the volume of the goods sold by the aquaculture and fishing industry.

While the IMPLAN database system includes a commercial fisheries category it does not fully represent the characteristics of shellfish farming. The model was adjusted to reflect the specific financial characteristics of the Virginia shellfish culture industry based upon grower income and expenditure statement provided by the primary grower survey.

Results

Direct Economic Impacts of Shellfish Aquaculture

The initial sales of farm raised shellfish and seafood products by Northampton County businesses generated a combined direct impact on local economic output of an estimated $36.8 million in 2013.

This direct economic impact of the shellfish aquaculture manifests itself in other economic growth measures as well. For example, the total direct employment associated with these shellfish farm sales was estimated to be 313 (full and part time jobs) in 2013.

Additionally the output and employment associated with the eastern shore shellfish farms generated an increase in labor incomes earned throughout the region. During 2013, personal incomes associated with initial aquaculture sales was $9.6 million. Table 2 summarizes three standard measures of direct economic impacts of the county's aquaculture and commercial fishing industries.

Indirect Economic Impacts of Hard Clam Aquaculture

Having calculated the first (direct) effects of the aquatic harvests on various measures noted above, the further ripple effect of the initial change was quantified using an input-output model.

Based upon information on the interrelationships among the sectors of the regional economy, the values of the inter-industry multipliers are generated by the IMPLAN input-output model. Quantifying from which industries the aquaculture and

Table 2 - Direct Economic Impact of Shellfish Aquaculture and Commercial Fishing in Northampton County, Virginia - 2013

	Aquaculture	Commercial Fishing	Total
Output ($ millions)	$36.8	$5.8	$42.6
Employment (fte)	313	163	476
Income ($ millions)	$9.6	$1.3	$10.9

Table 3 - Indirect Economic Impact of Shellfish Aquaculture and Commercial Fishing in Northampton County, Virginia - 2013

	Aquaculture	Commercial Fishing	Total
Output ($ millions)	$35.3	$0.2	$35.6
Employment (fte)	343	2	345
Income ($ millions)	$10.0	$0.1	$10.1

fisheries sectors buy production inputs and to which sectors its final products are sold enables estimates of the multiplier effects to be made. Understanding both the purchases of inputs and sale of goods and services by the marine products sectors allows the forward and backward linking of the clam farming sector's economic activity. This permits the tracing of expenditures as they multiply throughout directly and indirectly impacted sectors. The indirect impact measures are shown in Table 3.

The initial sales of shellfish growers and fishermen generated further indirect impact on local economic output of an estimated $35.6 million in 2013. As with the direct impacts the indirect economic impact of the hard clam aquaculture manifests itself in other economic growth measures as well. For example, the total indirect employment associated with firms providing necessary inputs to the eastern shore shellfish farm and commercial fishery sales was estimated to be 345 (full and part time jobs).

Additionally the output by firms selling to Eastern Shore clam farms generated increases in personal incomes earned throughout the region. For the Eastern Shore, personal income associated with the indirect support sectors of the hard clam aquaculture industry was $7.5 million over the same period.

Induced Economic Impacts

As a result of added employees' compensation and personal income directly generated from clam farm sales and similar growth in indirect (supply) industries, overall income levels rise, with further expansion of expenditure and economic activity in the region. The direct and indirect increases in household incomes noted above bring about economic activity in non-clam aquaculture industry sectors such as retail trades, eating and drinking establishments, banking, hospitals, real estate, etc. The induced or third round economic impacts, which result from the direct and indirect economic activity shown above, are summarized in Table 4.

Total Economic Impact

To summarize, in addition to direct impacts, two other types of impacts are estimated:

- Indirect impacts, which measure the change in production in backward linked industries caused by the changing input needs of directly effected industries;
- Induced impacts, which measure the change in regional household expenditure patterns caused by changes in household income arising in the direct and indirect sectors.

When taken together the economic impacts resulting from commercial shellfish aquaculture result overall in increases in economic output of $97.4 million, added employment of 987 individuals, accompanied by an overall increase in personal labor incomes of $27.1 million. These total economic impacts are summarized in Table 5

Economic impact is traditionally measured in various ways. Table 6 summarizes the impacts using six standard economic indicators. Table 7 reflects the added economic impacts to the Commonwealth of Virginia that arise from Northampton County's aquaculture and fisheries economic base.

Table 4 - Induced Economic Impact of Shellfish Aquaculture and Commercial Fishing in Northampton County, Virginia - 2013

	Aquaculture	Commercial Fishing	Total
Output ($ millions)	$18.7	$0.6	$19.2
Employment (fte)	161	6	167
Income ($ millions)	6.0	0.2	6.2

Table 5 - Total Economic Impact of Shellfish Aquaculture and Commercial Fishing in Northampton County, Virginia - 2013

	Aquaculture	Commercial Fishing	Total
Output ($ millions)	$90.8	$6.6	$97.4
Employment (fte)	817	170	987
Income ($ millions)	$25.6	$1.5	$27.1

Table 6 - Summary Economic Impacts in Northampton County from Northampton County Aquaculture & Commercial Fisheries Landings - 2014 ($ Millions)

		Aquaculture	Commercial fishing	Total
Labor Income Impacts	Direct Impacts	$9.6	$1.3	$10.9
	Indirect Impacts	$10.0	$0.1	$10.1
	Induced Impacts	$6.0	$0.2	$6.2
	Total	$25.6	$1.5	$27.1
Indirect Business Tax Impacts	Direct Impacts	$0.7	$0.0	$0.8
	Indirect Impacts	$1.1	$0.0	$1.1
	Induced Impacts	$1.4	$0.0	$1.5
	Total	$3.3	$0.1	$3.4
Other Property Income Impacts	Direct Impacts	$2.5	$0.0	$2.5
	Indirect Impacts	$3.4	$0.0	$3.4
	Induced Impacts	$4.1	$0.1	$4.3
	Total	$10.0	$0.2	$10.2
Total Value Added Impacts	Direct Impacts	$12.9	$1.3	$14.2
	Indirect Impacts	$14.5	$0.1	$14.6
	Induced Impacts	$11.6	$0.3	$11.9
	Total	$38.9	$1.8	$40.7
Output Impacts	Direct Impacts	$36.8	$5.8	$42.6
	Indirect Impacts	$35.3	$0.2	$35.6
	Induced Impacts	$18.7	$0.6	$19.2
	Total	$90.8	$6.6	$97.4
Employment Impacts (FTE)	Direct Impacts	313	163	476
	Indirect Impacts	343	2	345
	Induced Impacts	161	6	166
	Total	817	170	987

Table 7 - Summary of Statewide Economic Impacts of Northampton County Aquaculture & Commercial Fisheries Landings - 2014 ($ Millions)

		Aquaculture	Commercial fishing	Total
Labor Income Impacts	Direct Impacts	$9.6	$1.3	$10.9
	Indirect Impacts	$11.7	$0.1	$11.8
	Induced Impacts	$6.6	$0.2	$6.7
	Total	$27.9	$1.5	$29.4
Indirect Business Tax Impacts	Direct Impacts	$0.7	$0.0	$0.8
	Indirect Impacts	$1.3	$0.0	$1.3
	Induced Impacts	$1.6	$0.0	$1.6
	Total	$3.6	$0.1	$3.6
Other Property Income Impacts	Direct Impacts	$2.5	$0.0	$2.5
	Indirect Impacts	$3.9	$0.0	$3.9
	Induced Impacts	$4.5	$0.1	$4.6
	Total	$10.9	$0.2	$11.1
Total Value Added Impacts	Direct Impacts	$12.9	$1.3	$14.2
	Indirect Impacts	$16.8	$0.1	$17.0
	Induced Impacts	$12.6	$0.3	$13.0
	Total	$42.3	$1.8	$44.1
Output Impacts	Direct Impacts	$36.8	$5.8	$42.6
	Indirect Impacts	$39.6	$0.2	$39.8
	Induced Impacts	$20.4	$0.6	$21.0
	Total	$96.8	$6.6	$103.4
Employment Impacts (FTE)	Direct Impacts	313	163	476
	Indirect Impacts	365	2	367
	Induced Impacts	174	6	180
	Total	852	170	1,022

Appendix 1. Glossary of Input-Output Terms

Direct effects/impacts: Direct impacts represent the revenues, value-added, income, or jobs that result directly from an economic activity within the study area or a regional economy.

Employment or Jobs: Represents the total numbers of wage and salaried employees as well as self-employed jobs. This includes full-time, part-time and seasonal workers measured in annual average jobs.

Indirect Business Taxes: Include sales, excise, and property taxes as well as fees and licenses paid by businesses during normal operations. It does not include taxes on profits or income.

Indirect effects/impacts: Indirect effects occur when businesses use revenues originating from outside the region, or study area, to purchase inputs (goods and services) from local suppliers. This secondary, or indirect business, generates additional revenues, income, jobs and taxes for the area economy.

Induced effects/impacts: Induced effects or impacts occur when new dollars, originating from outside the study area, are introduced into the local economy. Induced economic impacts occur as the households of business owners and employees spend their earnings from these enterprises to purchase consumer goods and services from other businesses within the region. This induced effect generates additional revenues, income, jobs and taxes for the area economy.

Input-Output Analysis: The use of input-output models to estimate how revenues or employment for one or more particular industries, businesses or activities in a regional economy impact other businesses and institutions in that region, and the regional as a whole.

Input-Output Models: A mathematical representation of economic activity within a defined region using inter-industry transaction tables or matrices where the outputs of various industries are used as inputs by those same industries and other industries as well.

Labor Income: All forms of employment compensation, including employee wages and salaries, and proprietor income or profits.

Local/ Resident revenues/expenditures: Local revenues or spending represent simple transfers between individuals or businesses within a regional economy. These transactions do not generate economic spin-off or multiplier (indirect and induced) effects.

Margins: Represent the differences between retail, wholesale, distributor and producers prices.

Non-resident /Non-local revenues/expenditures: When outside or new revenues flow into a local economy either from the sale of locally produced goods and services to points outside the study area, or from expenditures by non-local visitors to the study area, additional economic repercussions occur through indirect and induced (multiplier) effects.

Other Property Type Income: Income in the form of rents, royalties, interest, dividends, and corporate profits.

Output: Revenues or sales associated with an industry or economic activity.

Total Impacts: The sum of direct, indirect and induced effects or economic impacts.

Value-added: Includes wages and salaries, interest, rent, profits, and indirect taxes paid by businesses. In the IMPLAN results tables, Value-added equals the sum of Labor Income, Other Property Type Income, and Indirect Business Taxes.

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Appendix 7

Economic Impact of Working Waterfront – Hampton, Virginia

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Economic Impact of Working Waterfront – Hampton, Virginia

August 2015

Thomas J. Murray
Virginia Institute of Marine Science
Virginia Sea Grant-Affiliated Extension

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Overview and Purpose of the Study

This study was performed to illustrate and quantify how much working waterfronts in this case, a seafood unloading and processing facility, contribute to a local and regional economy. Specifically the study addresses two objectives:

(1) Describes how seafood landing, processing and distribution activities at a working waterfront facility are linked to other businesses within the local community and the surrounding region;

(2) Estimates the economic impact (i.e., expenditures, economic output, incomes, and jobs) of the working waterfront.

Background

Hampton's commercial fisheries industry has historically represented an important component of the Commonwealth's commercial seafood industry. Hampton (still known to some as "crab town") was once responsible for processing nearly 50% of the crab meat produced in Virginia. Much of that economic activity has dispersed or simply been displaced by other non-water dependent economic activity.

Some of the historic working waterfront does remain. For example, much of the traditional seafood offloading, grading, packing, and processing in Hampton occur at L.D. Amory & Company, Inc. Seafood-laden vessels returning from extended trips navigate the federal channel into the Hampton anchorage basin so that they may dock and unload at the processing facility. Commercial fishing vessels are offloaded and the vessels then typically move to an adjacent dockage to refuel, make repairs, and prepare for the next trip. During this process, most of the revenues earned on a trip are spent within the local economy. Amory Seafood is a classic example of working waterfront representing a critical nexus between the marine fisheries and the community providing the primary remaining commercial fishing unloading point in Hampton. In view of this, the facilities socio-economic place in the community is both unique and fiscally important.

Today, most fishery products landed locally are not typically harvested in the waters immediately adjacent to the community, but rather are harvested from offshore waters and distant regions. Hampton became an important off-loading site due to the proximity to both inshore and offshore fishing grounds, presence of several processing/packing firms, availability of a wide range of repair and maintenance services, availability of fuel and ice, and significant, albeit limited, room for off-loading and moorage.

The off-loading of fishery products at the Hampton processing/packing facility sets in motion a number of economic activities that result in the sale of fresh and frozen value-added seafood products outside of Hampton. These economic activities include spending and re-spending of dollars, which creates incomes and jobs within several associated industries and markets. This process begins only with the off-loading of fresh whole fishery and seafood products at the processing/packing facility following a harvesting "trip" by a commercial seafood vessel. Typically the vessels' unloading use the catch proceeds to pay the crew and make local purchases necessary for the next trip. These purchases include fuel, ice, supplies, net/door repairs, deck equipment and hull maintenance, electrical services, groceries for the next trip, and other goods and services. The vessel crew also spends money within the local economy for lodging, transportation services, eating and drinking establishments, entertainment, and other activities.

Prior to being sold into the next market level, the processing/packing facility processes the offloaded seafood by cutting if necessary, sorting by size, boxing/icing and consolidating deliveries for shipment nationwide. In doing so, a "value-added" margin is created at each step as expenditures are incurred (labor, storage, refrigeration, packing materials, etc.) when the seafood is processed and packed for shipment. The resulting wholesale price then includes the original dockside price plus the margin and a profit markup. The wholesale buyer ships the seafood products out of the local area for further processing elsewhere or sells to distributors, food service buyers, grocery markets, or retail customers within Hampton and neighboring regions. When sold to either buyers outside of Hampton or non-residents visiting in Hampton, the transactions bring "new" revenue into the local economy.

The amount of economic activity associated with the Hampton seafood processing/packing industry is directly related to the volume and value of seafood off-loaded into the dockside processing facilities. The volume harvested is determined by the number of offshore and Bay fishing vessels unloading at the facility which is also determined by a number of factors such availability of competitive unloading facilities; stock abundance and fishing effort, which are in turn affected by environmental conditions in the fishing

regions; short-term weather conditions; state and federal fishery management measures such as quotas and seasons; and, the general market for seafood specific fishery products such as flounder.

Methodology

Collecting the Necessary Data

In order to understand the linkages with related industry sectors associated with off-loading, processing and packing seafood in Hampton, in depth interviews were conducted with the manager and owner of the seafood processing/packing facilities in Hampton. These interviews yielded detailed information on disposition of initial payment to off-loading seafood vessels, vessel revenue/expense categories and amounts, expenditures associated with processing the seafood (i.e., sorting, washing, thawing, heading, packaging, storing, and shipping and packing). Additional estimates of the percentage processed seafood exported from Hampton, numbers of vessels off-loading during a typical season, number of off-loading events per vessel per season, and other related information was obtained.

Economic Impact Estimation

The information collected was utilized in estimating the initial economic activities in the Hampton economy associated with one firm in the Hampton seafood processing/packing industry. These economic activities take the form of initial expenditures, economic output, wages, salaries, and employment.

Values for each of these are estimated by employing the IMPLAN model, a computer software and database package designed for regional economic impact analysis in the United States at the county level (Minnesota IMPLAN Group, Inc., 1997). The analytical framework for IMPLAN is the "input-output" economic modeling approach originally described by Leontief (1959). The model utilizes databases consisting of a set of social/economic accounts which describe the structure of the U.S. economy in terms of transactions between households, governments, and over 500 standardized industry sectors classified on the basis of the primary commodity or service produced. This model utilized the IMPLAN economic data package for the City of Hampton and the Commonwealth of Virginia.

Regional models may be constructed in IMPLAN for any county, group of counties, or state or territory in the U.S. Economic impacts for a given region are specified in IMPLAN as a change in final demand, output, or employment for a particular industry sector or social institution, (e.g., households, government). The aggregate economic impact of these changes is calculated by a matrix inversion procedure that develops economic multipliers, which reflect the direct, indirect and induced impacts. Direct, indirect, and induced impacts are set in motion within the City of Hampton by changes in the supply and demand of raw seafood, which in turn affects the demand for the goods and services associated with producing raw seafood.

The commercial seafood industry in Hampton represents a "basic" industry in that it produces a product for sale outside the local area. Dollars generated through these out-of-county sales (or consumption locally by non-residents), when re-spent in the community, produce additional county-wide economic impacts. A "basic" industry directly affects economic activity in the region when its product is sold outside the local area. For the commercial seafood industry in Hampton, this would include sales, jobs, and earnings generated in commercial fishing and other activities related to the preparation of the seafood for shipping to market. These *direct* activities produce additional *indirect* effects in the local economy as dollars earned through the sale of seafood are re-spent locally[1]. Indirect effects represent purchases of local products by seafood vessels, such as ice, fuel, gear and net repair, groceries, etc. All the indirect effects are additional economic activity in the community and are indicative of additional jobs and income generated by the sale of seafood outside the community.

Direct and indirect activities associated with commercial seafood harvesting, processing and the sale of seafood outside Hampton then produce additional *(induced)* local impacts. These impacts are associated with the spending of income earned in the direct and indirect activities. This spending translates into local retail sales, local bank deposits, and the purchase of a diverse mix of consumer goods. An assessment of the total economic impact of a basic industry, such as commercial seafood on Hampton, must consider the sum of the direct, indirect, and induced activities. In essence, the sale of Hampton landed fishery products outside the community triggers a chain of local spending, which generates income and leads to additional spending. This process, however, is not infinite in nature. At each round of spending, for example, some dollars are lost (leaked) from the local economy. Leakages are in the form of savings in non-local institutions, taxes/fees paid to the state and federal governments, and payments for goods and services used in the preparation of raw seafood for market, which are initially purchased outside the local area. Thus, the true economic

[1] *See Appendix 2 for a Glossary of Economic Impact modelling definitions.*

impact from non-local sales of Hampton-landed seafood is represented by the new dollars remaining after accounting for the various "leaks" in the Hampton economy overall in specifically its seafood processing/packing industry.

Thus, the total economic activities and impacts to the Hampton economy initiated by off-loading seafood in Hampton are estimated. The *direct, indirect,* and *induced* effects, are expressed in standard impact terms of economic output (sales of seafood), personal incomes, total value added (wholesale margin), and employment is estimated via the IMPLAN model. The estimates are from actual landings financial information for 2012.

Hampton Industry / Economy Linkages

The economic linkages between the Hampton seafood processing/packing industry and other sectors of the local economy were revealed in part through individual interviews and consultations with members of the local business community in Hampton. However, additional insight into the economic linkages was obtained by a review of annual cost data for 15 commercial fishing vessels similar to those that utilize the Hampton anchorage as their homeport. During the 2012 season, 37 different offshore vessels, and 25 individual inshore (Bay) boats were unloaded on a continual basis. These vessels typically incurred similar expenses related to harvest and overhead. The largest single expenses were crew share, fuel, maintenance and repair and supplies. Other costs included nets and gear, groceries, insurance, and loan interest. Crew share (offshore seafood vessels typically have at least 3 crew members) represents incomes spent within the local economy, particularly if the crewmembers reside in households within the community. Crew members from non-local vessels also spend a large portion of their crew share within the local economy for lodging, food, entertainment, transportation, etc. while waiting for their vessel to make the next trip.

The economic activities associated with the seafood industry are set in motion by the landing of raw seafood flows to the processors/packers as dockside revenues flow to the vessels. The raw seafood is then processed (gutted, graded, boxed, iced, etc.) by the processors/packers. To accomplish this task, however, supplies are purchased from local suppliers of goods and services, while labor is purchased from local households.

Some seafood is sold to local seafood distributors and retailers, but the majority is sold to wholesale firms out of the region. The revenue generated by these "export" sales represents new dollars in the Hampton economy that are then spent again and again within the local economy as earnings by local households are used to purchase goods and services from other local businesses and seafood from local seafood dealers. In addition, dockside revenues initially paid to seafood vessels is used by crewmembers to purchase goods and services from both fishing-related suppliers other local businesses. Some dockside revenues are used to purchase labor from local households as seafood vessel crewmembers. Some dockside revenues may also be retained in the local economy by vessel owners who reside in Hampton households. Finally, some of this revenue is used to re-initiate the process by purchasing the next load of seafood that arrives at the dock.

Results of the Economic Impact Analysis

The magnitude of the estimated economic impacts is directly related to landings volumes, dockside price, wholesale markup, and the export percentage. Thus, the actual economic impacts associated with the Hampton seafood industry will vary from year to year. As landings increase, the economic impacts will increase (assuming all other factors remain proportionally constant). Similarly, as landings or market price for seafood decrease, the economic impacts will also likely fall.

This is of interest given the reported constraints on moorage space that confront the seafood processing/packing activities on Hampton. Seafood-laden vessels returning from a trip will moor in a parallel fashion at the dock in front of one of the facility. The seafood is off-loaded by hand or mechanically. This task is time consuming and requires the use of both vessel deckhands and workers from the processing facility. Once the vessel is emptied, it will move out of the way to make room for the next vessel to be off-loaded. The empty vessel will moor at an adjacent location and begin servicing (i.e., maintenance, refueling, repair, etc.) required for the next trip. At times vessels will be moored three and four abreast for several days as they wait servicing for the next trip. The logistics of accepting additional vessels to be off-loaded becomes a problem when there is insufficient room at the docks to moor empty vessels. When the moorage space within the basin is fully utilized, incoming vessels may need to be off-loaded at other suitable locations which are limited in number and capability.

In such an event the economic activity associated with the seafood products that would have been off-loaded in Hampton is lost to the local economy; as well as the provisioning of the vessels for the next fishing voyage.

In a real sense, the values reported herein also provide an estimate of the economic impact that is lost to the local economy when commercial fishing vessels lose water access to Hampton and its working waterfront, choosing the next best alternative port facility out of the region.

The seafood processing/packing industry on Hampton represents an important component of the local economy. Activities associated with harvesting, offloading, processing, packing, and shipping seafood from the Hampton facilities has been shown to be intrinsically linked with several sectors of the local economy. These activities create positive economic impacts to the local economy as seafood products are sold to buyers located outside of Hampton and nonresidents purchase seafood locally. The sale of seafood to both local and non-local buyers results in the purchase of inputs from a variety of service and supply firms, and the distribution of incomes to local employees. These expenditures are circulated within the Hampton economy as these dollars are spent and re-spent. The total economic impact of the Hampton seafood industry depends on the amount of seafood landings and the general economic conditions that exist at any given time. Thus, the actual impact values will vary from year to year.

Similarly, the economic impacts associated with an average off-loading event can vary. Table 1 reflects the ranges of economic impact of this working waterfront using two different data assumptions. Under normal conditions with landings at the volumes reported during this project, the total economic output associated with all seafood off-loading events are estimated to approach $15.6 to $17.8 million. In addition, $3.8 to $5.0 million in personal incomes, $5.3 to $7.1 million in value added impacts, and almost 283 to 296 jobs may result. These values also reflect the type of economic losses that would be associated with vessels being diverted from Hampton should the commercial fishing working waterfront facilities in Hampton be displaced or otherwise become unavailable.

Comparison of impacts using IMPLAN Commercial Fishing Sector (17) for seafood versus actual fishing vessel P&L data demonstrate a reasonable range of values for Hampton Virginia. On a summary level the comparison is listed in Table 1.

The larger total output value for the Sector 25 impacts is attributable to the assumption that all of the value of seafood is included in the direct output for Amory's operations. In contrast when this value of landings are distributed across the various categories of expenditure much of this spending leaks from the local economy (in this case the Virginia economy).

Interestingly, there is relatively little difference in the employment impacts of the alternative calculations. In both calculations the majority of the jobs are in commercial fishing, about 240 jobs in each case. Given the very low income associated with each "job," it is worth emphasizing that these job estimates are associated with the landings of fishing vessels. The crews on most vessels are in fact not employees but rather are self-employed generating income only as a share in the sale of the catch. As such they are short-term employments. For any given commercial fisherman, several of these jobs are likely to constitute employment in a given year.

Conclusions

This study has shown that the seafood processing/packing industry in Hampton generates positive economic impacts to the local economy. Any decisions to address the water access for commercial seafood operations such as those that currently exist should carefully consider the economic contributions associated with the industry, while comparing against the costs of creating additional moorage space or reconfiguring the existing dock space.

Table 1. Economic Impact of Amory & Company Using Two Model Calibrations

	Using Sector 17	Using fishing vessel P&L
Labor Income Impacts	$3.8	$5.0
Indirect Business Tax Impacts	$0.5	$0.6
Other Property Income Impacts	$0.9	$1.5
Total Value Added Impacts	$5.3	$7.1
Output Impacts	$15.6	$17.8
Employment Impacts	283	296

Appendix 1. Working Waterfront: Ranges of Economic Impacts

Detailed Economic Impact of Amory & Company Using Two Model Calibrations ($ Millions)		
	Using Sector 17	**Using fishing P&L**
Labor Income Impacts (Primary)	$1.8	$2.3
Direct Impacts	$0.5	$1.2
Indirect Impacts	$0.8	$0.5
Induced Impacts	$0.7	$1.0
Total	$3.8	$5.0
Indirect Business Tax Impacts (Primary)	$0.1	$0.1
Direct Impacts	$0.1	$0.3
Indirect Impacts	$0.1	$0.0
Induced Impacts	$0.3	$0.2
Total	$0.5	$0.6
Other Property Income Impacts (Primary)	$0.0	$0.0
Direct Impacts	$0.2	$0.5
Indirect Impacts	$0.3	$0.2
Induced Impacts	$0.4	$0.7
Total	$0.9	$1.5
Total Value Added Impacts (Primary)	$1.9	$2.4
Direct Impacts	$0.9	$2.0
Indirect Impacts	$1.1	$0.8
Induced Impacts	$1.4	$2.0
Total	$5.3	$7.2
Output Impacts (Primary)	$9.5	$9.5
Direct Impacts	$1.4	$3.7
Indirect Impacts	$2.2	$1.3
Induced Impacts	$2.4	$3.3
Total	$15.6	$17.8
Employment Impacts (#) (Primary	243	243
Direct Impacts	7	17
Indirect Impacts	14	9
Induced Impacts	19	27
Total	283	296

Appendix 2. Glossary of Input-Output Terms

Direct effects/impacts: Direct impacts represent the revenues, value-added, income, or jobs that result directly from an economic activity within the study area or a regional economy.

Employment or Jobs: Represents the total numbers of wage and salaried employees as well as self-employed jobs. This includes full-time, part-time and seasonal workers measured in annual average jobs.

Indirect Business Taxes: Include sales, excise, and property taxes as well as fees and licenses paid by businesses during normal operations. It does not include taxes on profits or income.

Indirect effects/impacts: Indirect effects occur when businesses use revenues originating from outside the region, or study area, to purchase inputs (goods and services) from local suppliers. This secondary, or indirect business, generates additional revenues, income, jobs and taxes for the area economy.

Induced effects/impacts: Induced effects or impacts occur when new dollars, originating from outside the study area, are introduced into the local economy. Induced economic impacts occur as the households of business owners and employees spend their earnings from these enterprises to purchase consumer goods and services from other businesses within the region. This induced effect generates additional revenues, income, jobs and taxes for the area economy.

Input-Output Analysis: The use of input-output models to estimate how revenues or employment for one or more particular industries, businesses or activities in a regional economy impact other businesses and institutions in that region, and the regional as a whole.

Input-Output Models: A mathematical representation of economic activity within a defined region using inter-industry transaction tables or matrices where the outputs of various industries are used as inputs by those same industries and other industries as well.

Labor Income: All forms of employment compensation, including employee wages and salaries, and proprietor income or profits.

Local/ Resident revenues/expenditures: Local revenues or spending represent simple transfers between individuals or businesses within a regional economy. These transactions do not generate economic spin-off or multiplier (indirect and induced) effects.

Margins: Represent the differences between retail, wholesale, distributor and producers prices.

Non-resident /Non-local revenues/expenditures: When outside or new revenues flow into a local economy either from the sale of locally produced goods and services to points outside the study area, or from expenditures by non-local visitors to the study area, additional economic repercussions occur through indirect and induced (multiplier) effects.

Other Property Type Income: Income in the form of rents, royalties, interest, dividends, and corporate profits.

Output: Revenues or sales associated with an industry or economic activity.

Total Impacts: The sum of direct, indirect and induced effects or economic impacts.

Value-added: Includes wages and salaries, interest, rent, profits, and indirect taxes paid by businesses. In the IMPLAN results tables, Value-added equals the sum of Labor Income, Other Property Type Income, and Indirect Business Taxes.

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