Northern Neck Planning District Commission Virginia Coastal Zone Management Program's PDC Technical Assistance Program Task #45 FY09/10 Final Report

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 #NA09NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended.

Northern Neck Planning District Commission FY09/10 Coastal Program Technical Assistance Grant, Task 45 Final Report

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Lancaster County Requested Maps

Lancaster County staff requested a map that would estimate the number of households in a 5, 10 and 20 mile radius of the center of the Town of White Stone. NNPDC staff mentioned that the 2000 census data is over a decade old and might not give the best representation of households in the region. NNPDC staff suggested using addressable E911 structures as a proxy for households. Although there are commercial e911 structures in each county, the majority of structures in the Northern Neck are for residences. NNPDC staff digitized the three radius circles, merged Richmond, Lancaster and Northumberland County E911 address points, and then clipped the points by the radius polygons to calculate the number of addressable E911 structures in the various radii.

The Town of White Stone requested a field survey of a stream within the town limits by Department of Conservation and Recreation, Division of Chesapeake Bay Local Assistance (DCR-DCBLA) for determination of intermittent or perennial status. The status of a stream affects the Chesapeake Bay 100 foot Resource Protection Area, as intermittent streams in Virginia do not require the 100 foot Resource Protection Area buffer, whereas perennial streams must have an intact 100 foot vegetated buffer. In order to plan for the fieldwork, a DCR-DCBLA staff person requested a USGS topographic map with the current Chesapeake Bay Resource Protection Area (RPA), as well as an aerial photo with the RPA depicted. *(Due to file size limitations, the aerial photo map has not been included.)* The DCR-DCBLA staff mentioned that the field work would be completed in the summer and that they would request NNPDC assistance in modifying the Lancaster County 100 foot Resource Protection Area if determined to be necessary by the results of the perennial status determination fieldwork.

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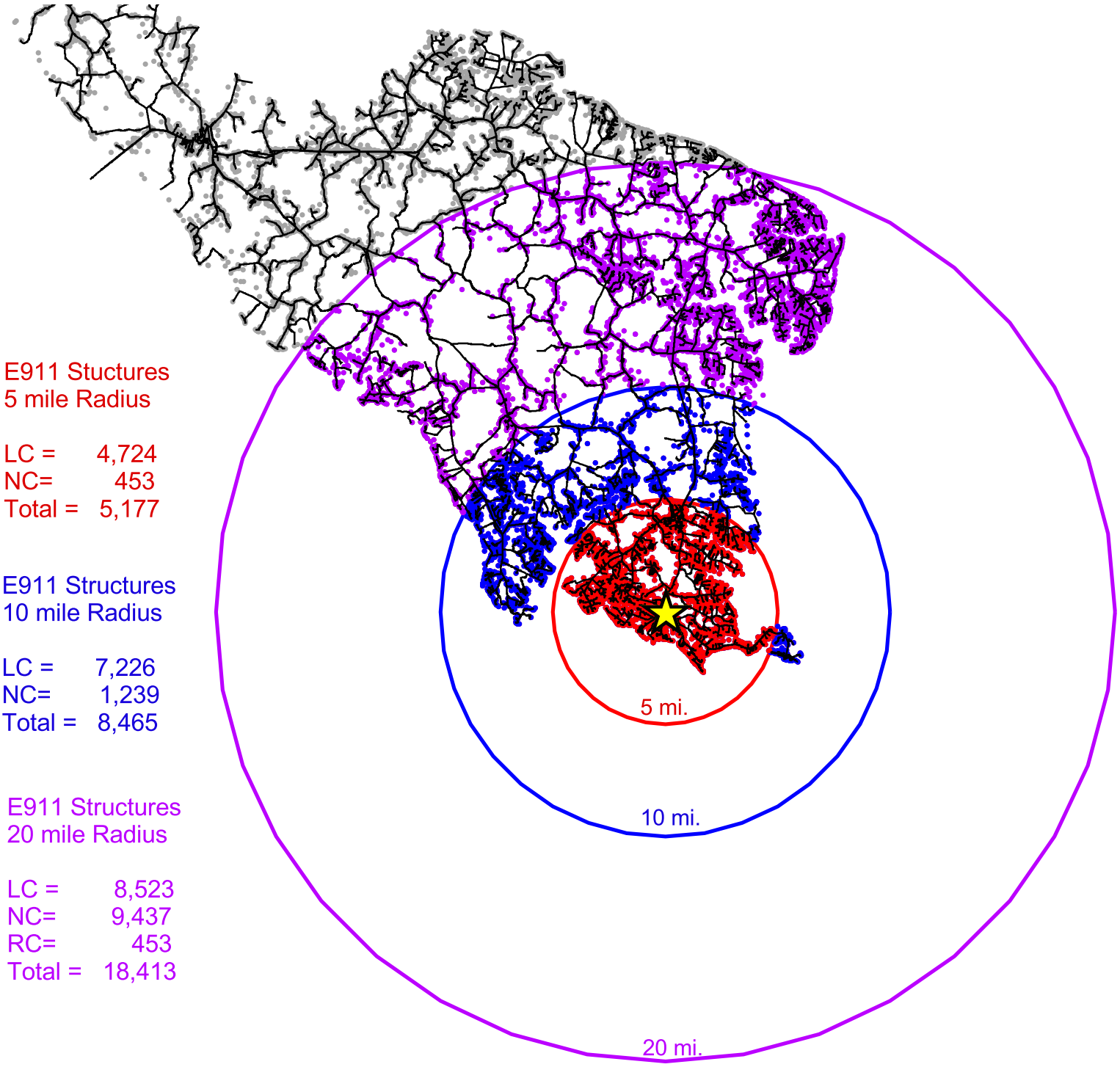
Number of Northern Neck PDC E911 Structures within a 5, 10 and 20 Mile Radii of White Stone Signal



E911 Stuctures
5 mile Radius

LC = 4,724
NC= 453
Total = 5,177

E911 Structures
10 mile Radius

LC = 7,226
NC= 1,239
Total = 8,465

E911 Structures
20 mile Radius

LC = 8,523
NC= 9,437
RC= 453
Total = 18,413

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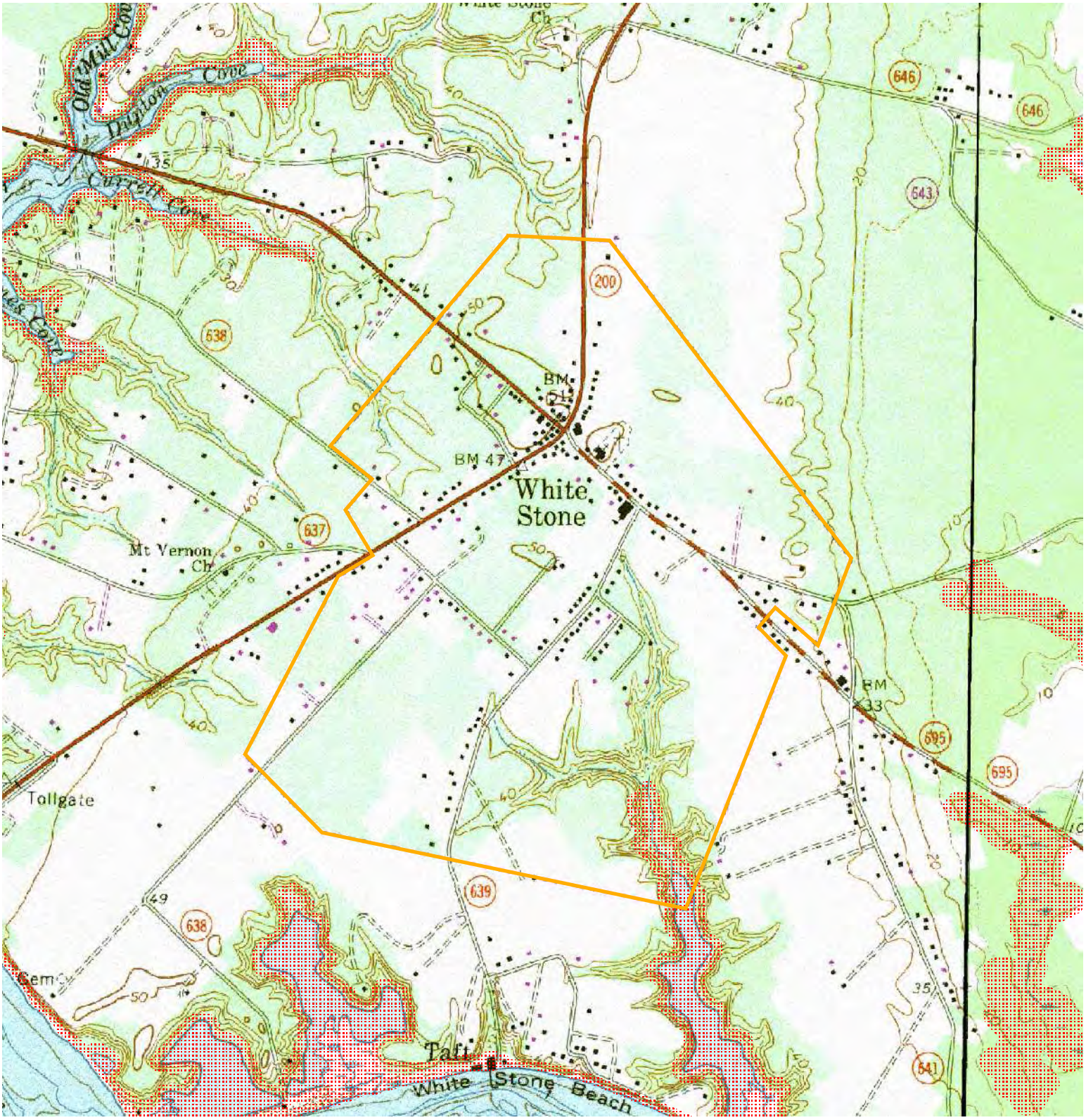
White Stone 100 Foot Chesapeake Bay Resource Protection Area



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Northumberland County Requested Maps

Northumberland County requested a map to support a Department of Housing and Community Development block grant application for housing upgrade and rehabilitation for an area in the county, along Light Street in interior of the county. The area in question has many substandard houses and some trailers with inadequate or failing onsite sewage systems as well as substandard plumbing. Northumberland County included this map in its grant application and was subsequently awarded the grant. NNPDC staff will assist in administrating this grant to help reduce pollution and provide adequate housing for low income residents.

Northumberland County also requested a map of the closed Tri-County Landfill. In the 1970's, Richmond, Lancaster, and Northumberland counties joined together to create and operated a landfill. The landfill closed in the 1980's and a groundwater remediation plan for the site has been ongoing, initiated by Virginia DEQ. Currently there has been interest from an outside party to acquire the property to redevelop the current brownfield into a productive asset to the county.

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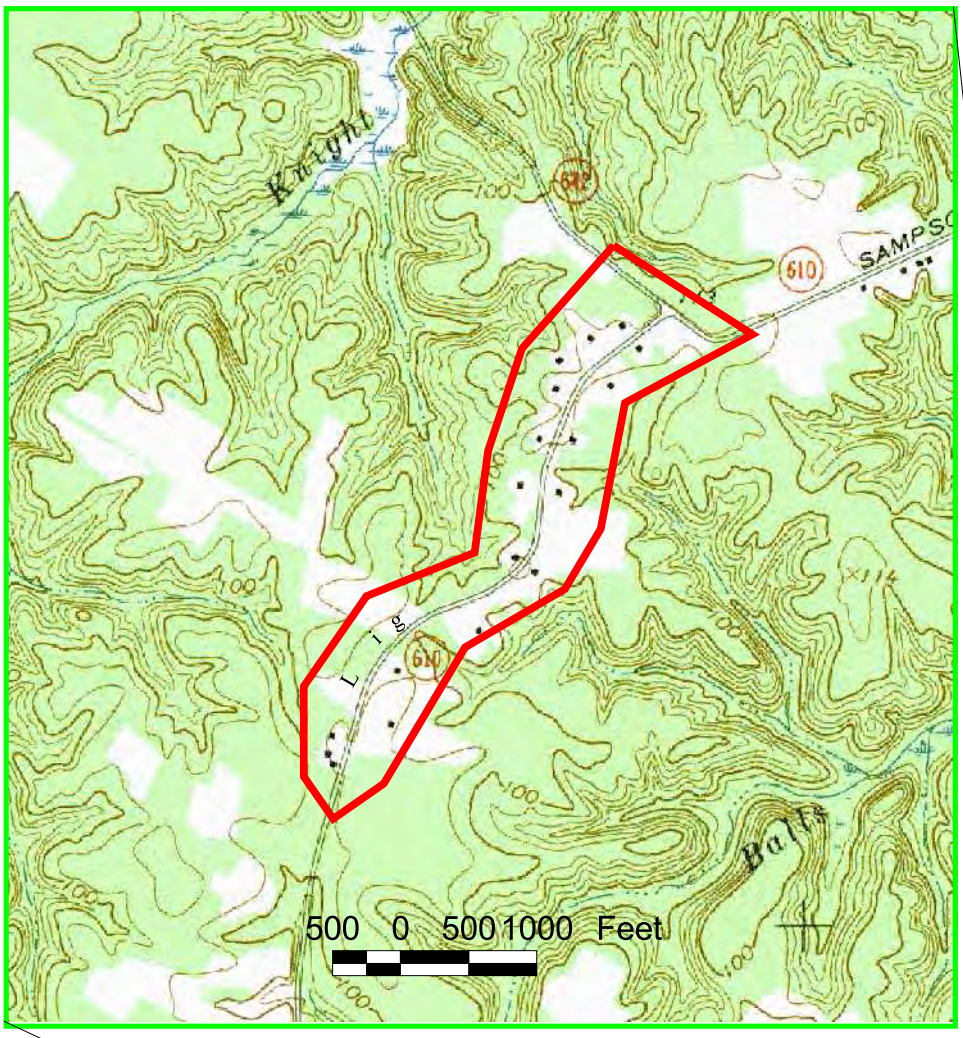
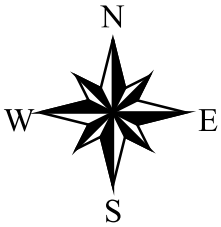
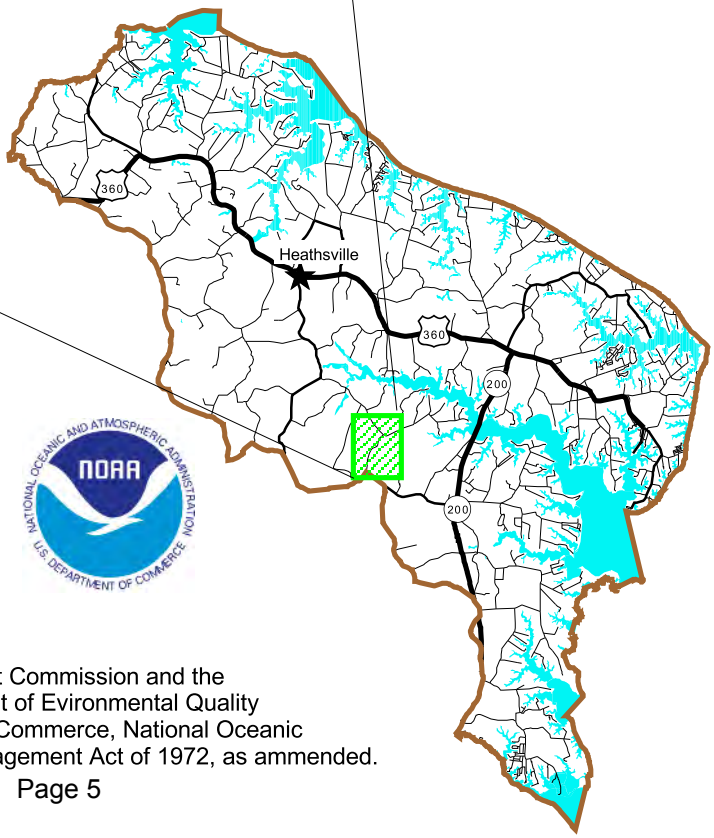
Northumberland County

Light Street Project Area



Lancaster USGS
1:24,000
Quadrangle Map





Prepared by:

March 2010

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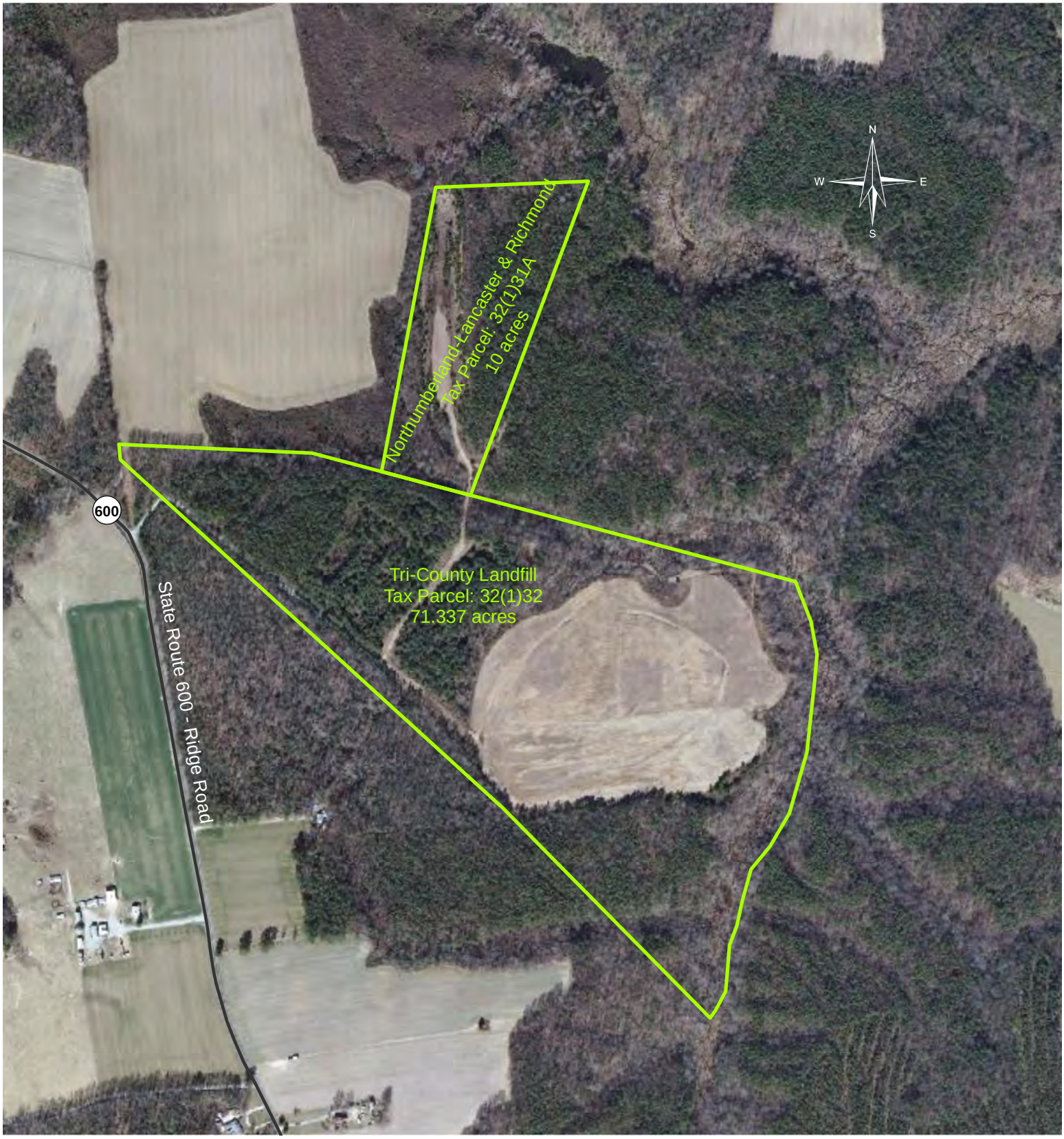
Northumberland County:
Tri-County Landfill and Adjacent Parcel



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Westmoreland County Requested Maps

The NNPDC has been assisting Westmoreland County with the revision of its comprehensive plan since April 2008. A comment made at one of the work session was that NNPDC staff had replaced the old comprehensive plan shellfish condemnation map with the website address of the Virginia Department of Health, Division of Shellfish Sanitation (VDH-DSS). The rationale behind this change was that the condemned shellfish areas change whenever VDH staff water quality sampling show that the shellfish standard for bacteria has been exceeded. Therefore, any map created would be quickly out of date (and inaccurate). Since the VDH-DSS website always has the current (most up-to-date) condemnation map, the thought was that the interested citizen could look up the most up-to-date condemned shellfish areas online, either at home or at the local library. However, Westmoreland Comprehensive Plan Committee members wanted a map in the comprehensive plan that depicted condemned shellfish areas. Therefore NNPDC staff created a shellfish condemnation map that was up-to-date as of the creation date of April 2010. The website address was also included in the narrative for those interested in more information.

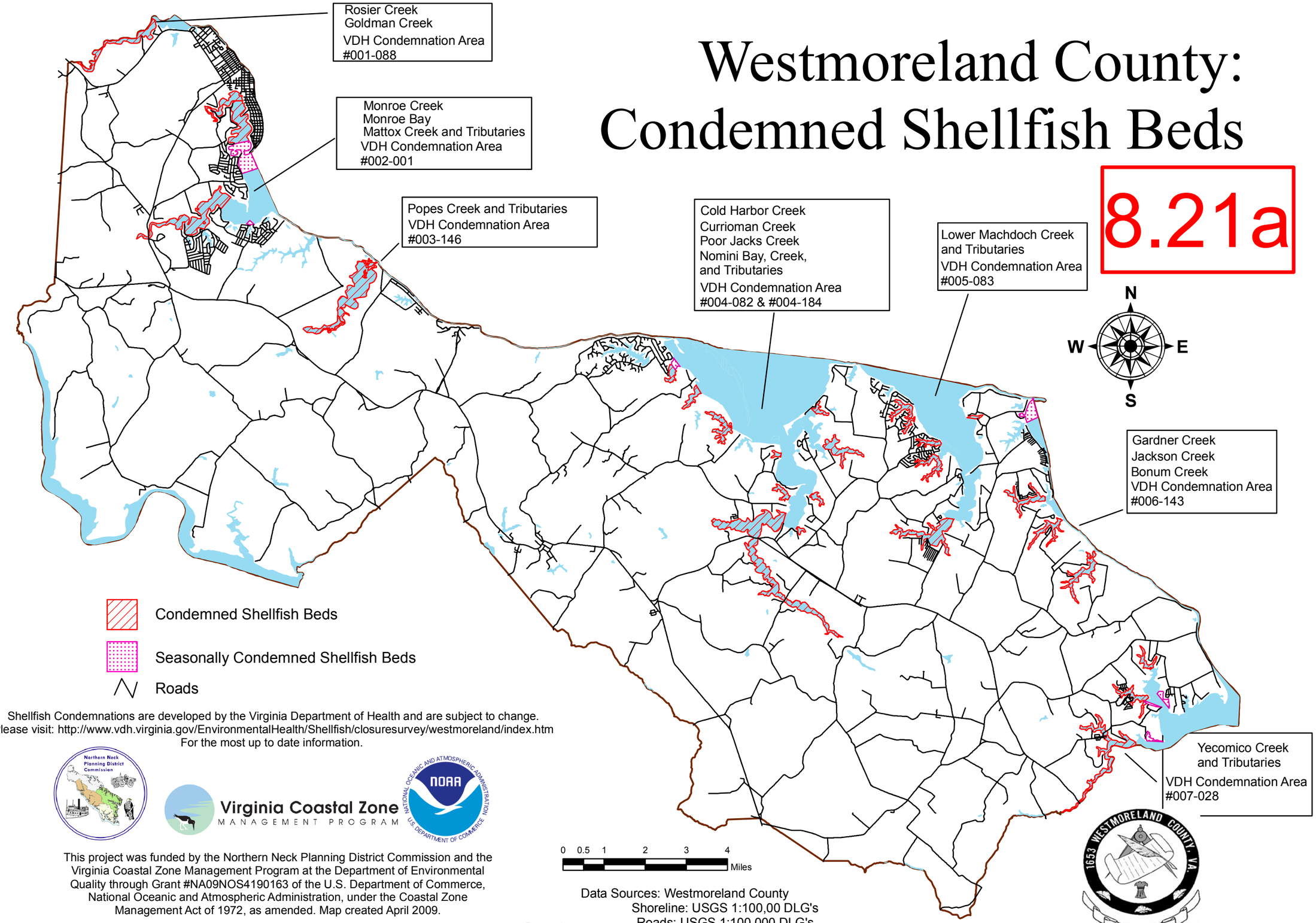
The Virginia Department of Conservation and Recreation, Division of Chesapeake Bay Local Assistance (DCR-DCBLA) reviewed the draft Westmoreland County comprehensive plan to ensure that it still met the requirements of the Chesapeake Bay Act, as required by state law. In July 2010 DCR-DCBLA staff gave Westmoreland County and the Northern Neck Planning District Commission their comments on the draft plan. DCR-DCBLA staff requested NNPDC staff update two maps that were in the old comprehensive plan that were eliminated from the newly revised comprehensive plan. These two maps were a pollution sources map (from the VDH-DSS shoreline surveys) and a water access map. NNPDC staff compiled the data and created updated versions of these two maps. DCR-DCBLA staff also asked for a map to illustrate the importance of fisheries to the county, as well as the importance of water quality to healthy fisheries and a healthy local economy. NNPDC staff contacted the Virginia Coastal Zone Management Program GIS staff and requested GIS data from the Virginia Coastal GEMS interactive web mapping site. Data requested included public baylor grounds, commercial aquaculture sites, private oyster leases, constructed oyster reefs, fisheries management areas, as well as private oyster gardening sites. VACZM GIS staff responded to the request the same day it was received, and NNPDC created a fisheries map with all VACZM provided fishery GIS data layers.

Westmoreland County staff requested a map of the area around Coles Point with the most up-to-date aerial photo. Westmoreland County staff did not explain the reason for the map, but it might have had to do with some enforcement actions in the area.

Westmoreland County staff also passed along a request from the Town of Colonial Beach for a map of the watershed within the town. Town staff were investigating creation of a stormwater utility and wanted to understand how many watersheds were in the town and which body of water they drained towards.

Westmoreland County: Condemned Shellfish Beds

8.21a



Condemned Shellfish Beds

Seasonally Condemned Shellfish Beds

Roads

Shellfish Condemnations are developed by the Virginia Department of Health and are subject to change.
Please visit: http://www.vdh.virginia.gov/EnvironmentalHealth/Shellfish/closuresurvey/westmoreland/index.htm
For the most up to date information.

Virginia Coastal Zone MANAGEMENT PROGRAM

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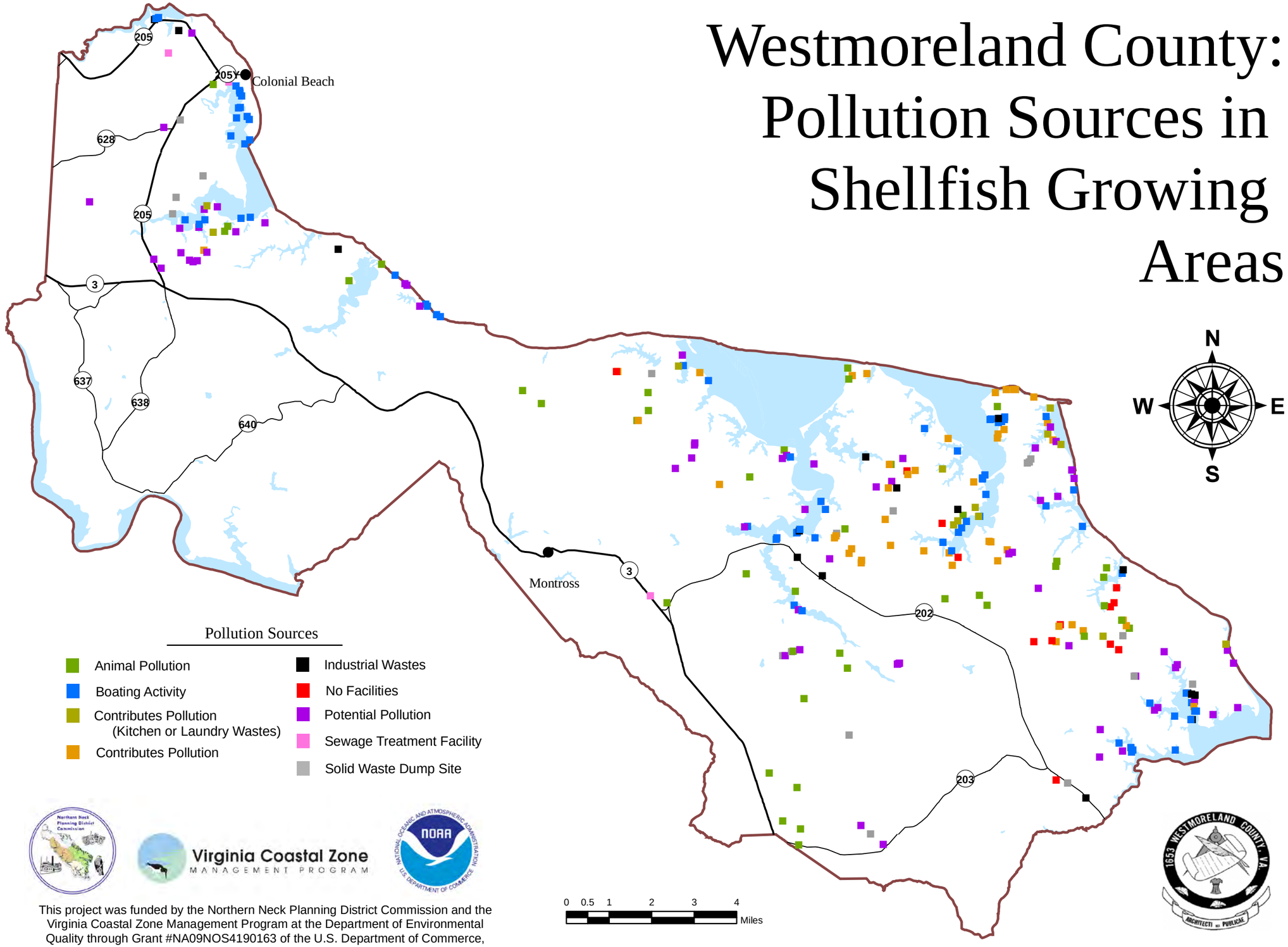
Data Sources: Westmoreland County
Shoreline: USGS 1:100,00 DLG's
Roads: USGS 1:100,000 DLG's
Condemned Shellfish Areas: Virginia Dept. of Health

Westmoreland County: Pollution Sources in Shellfish Growing Areas



Virginia Coastal Zone MANAGEMENT PROGRAM

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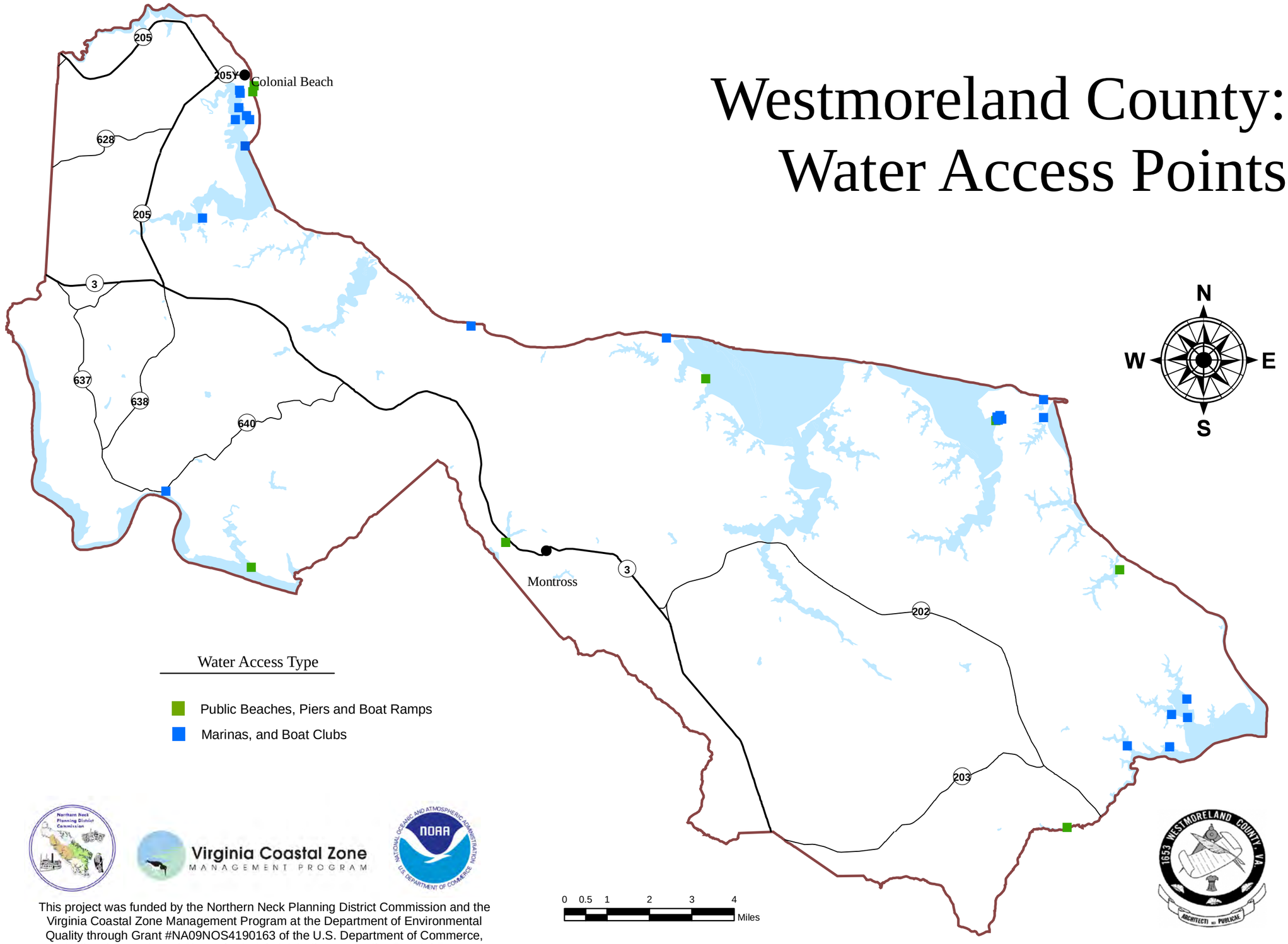
Data Sources: Virginia Department of Health, Division of Shellfish Sanitation, Shoreline Surveys of Growing Areas 001, 002, 003, 004, 005, 006, 007, 2003-2010.
http://www.vdh.state.va.us/EnvironmentalHealth/Shellfish/closureSurvey/index.htm#Survey
Shoreline: USGS 1:100,00 DLG's
Roads: USGS 1:100,000 DLG's

Westmoreland County: Water Access Points



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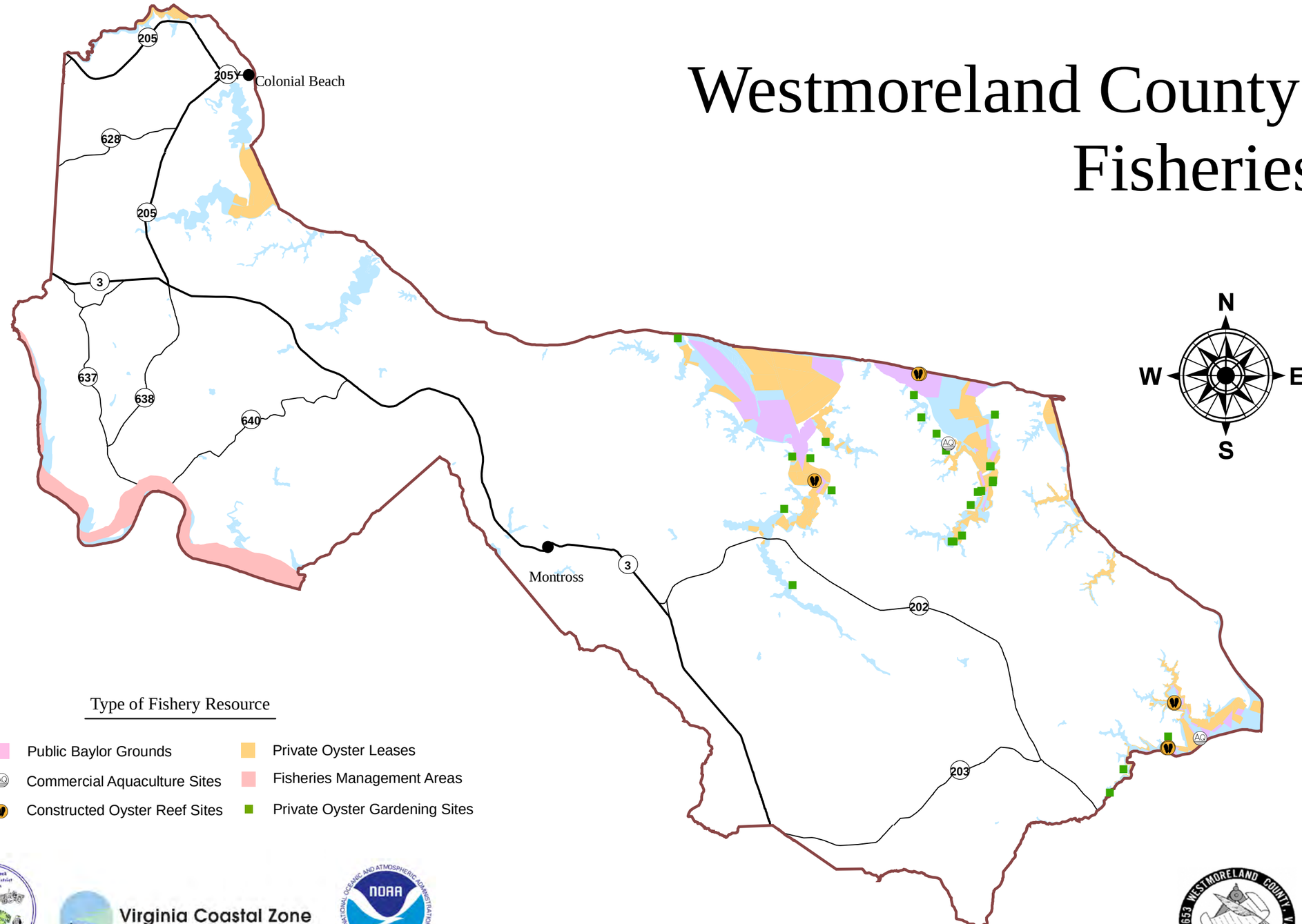
Data Sources: Virginia Department of Game and Inland Fisheries and other sources.
Shoreline: USGS 1:100,00 DLG's
Roads: USGS 1:100,000 DLG's

Westmoreland County: Fisheries



Type of Fishery Resource

- Public Baylor Grounds
- Commercial Aquaculture Sites
- Constructed Oyster Reef Sites
- Private Oyster Leases
- Fisheries Management Areas
- Private Oyster Gardening Sites

0 0.5 1 2 3 4 Miles

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Data Sources: Virginia Coastal Zone Management Programs, Coastal GEMS data layers - http://www.deq.state.va.us/coastal/coastalgems.html
Shoreline: USGS 1:100,00 DLG's
Roads: USGS 1:100,000 DLG's

Feet
0 250 500 1,000 1,500 2,000

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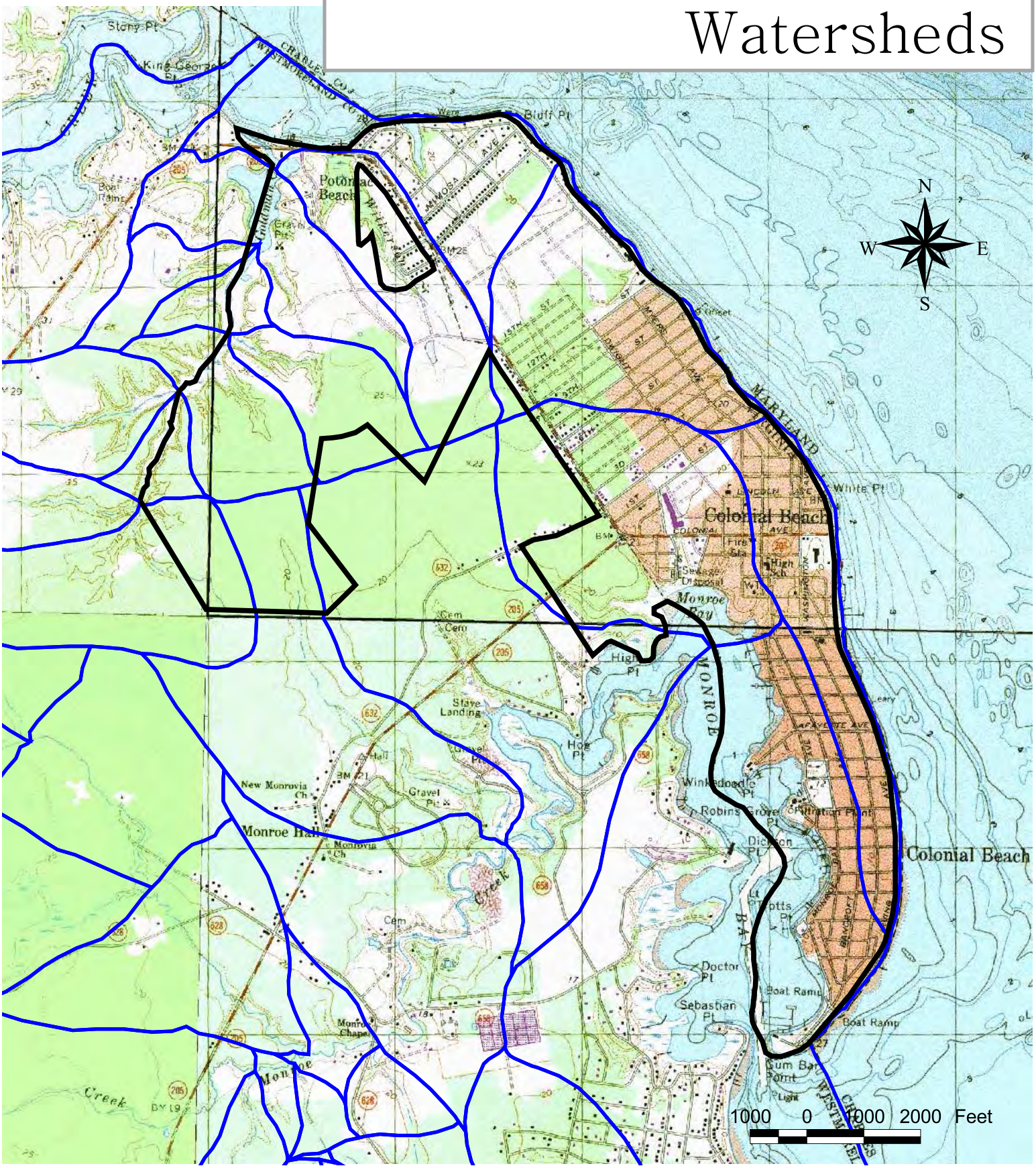
Town of Colonial Beach Watersheds



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Virginia Department of Conservation and Recreation Requested Maps

DCR requested maps to support the newly strengthened dam safety regulations. The first map was created in March of 2010 and showed one of two dams in the Northern Neck that were big enough for the dam safety regulations to apply. Both of these dams are located in Westmoreland County. The landowners of the two dams, under the new regulations, have to create and maintain an Emergency Action Plan (EAP) in case of dam failure. The first map requested in March 2010 showed the tax parcels of the owner of the lake, so DCR could interpret how much land the landowner controlled and which lands downstream of the dam were not owned by the dam owner. In August 2010, two location maps, one for each of the dams, were requested. The first dam is Independence Lake, a private lake located in the Stratford Harbour subdivision. The second dam is used for irrigation of the Red Oak Nurseries, slightly north of Nomini Grove on Rt. 3.

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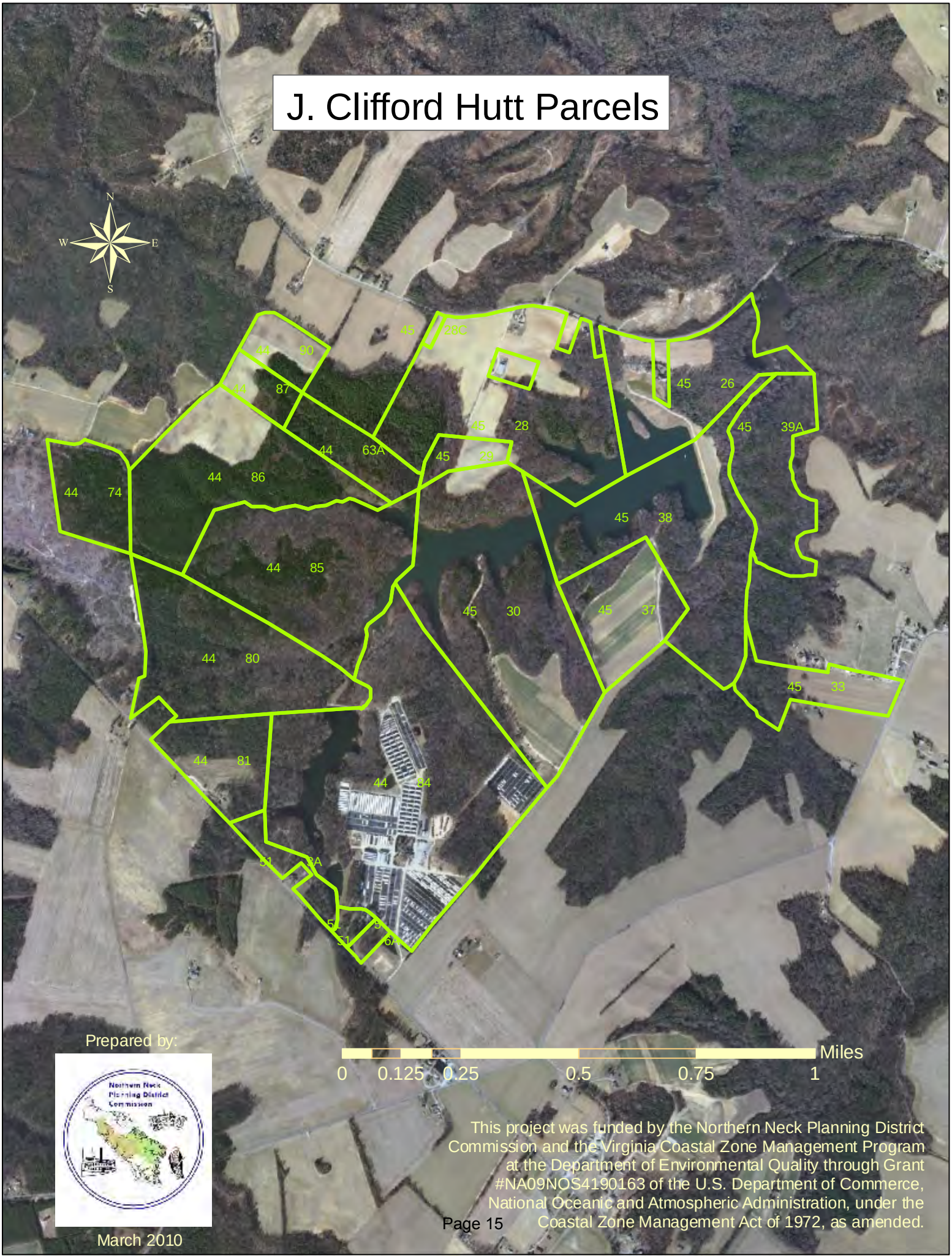
J. Clifford Hutt Parcels



Prepared by:

Northern Neck Planning District Commission

March 2010

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Westmoreland County
Independence Lake Dam Location

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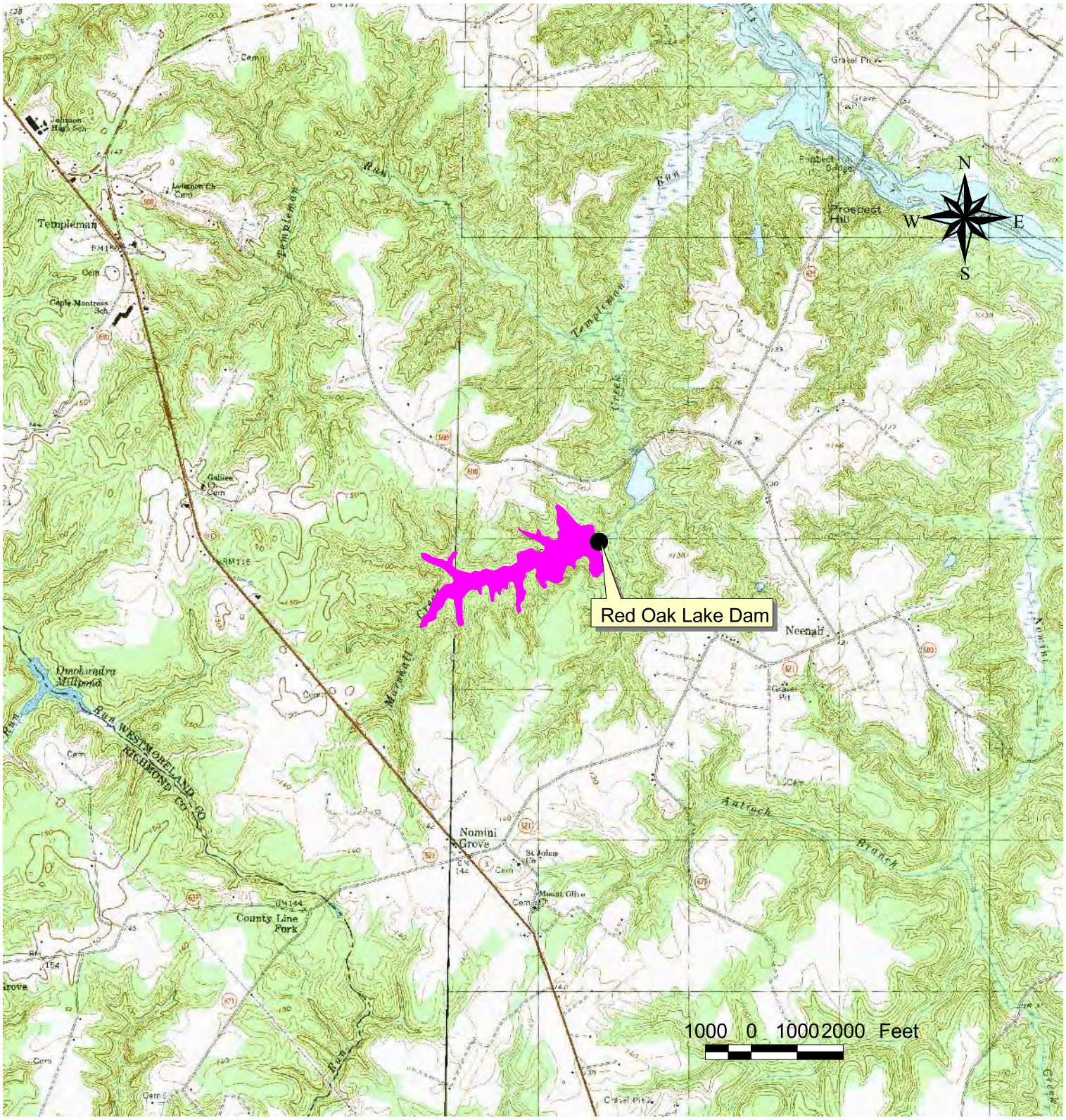
Map Prepared August 2010

Westmoreland County
Red Oak Lake Dam Location



Virginia Coastal Zone MANAGEMENT PROGRAM

Map Prepared August 2010

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Other Requested Maps

SAIF Water (http://www.saifwater.org/), a local group that promotes safe drinking water for rural Virginians, requested mapping assistance with a research project they were undertaking into which local aquifers were currently being tapped for potable water in the Northern Neck Region. Last grant year, NNPDC staff worked on a pilot project for SAIF Water of well data for Westmoreland County. This year, SAIF Water research staff supplied NNPDC staff with a database of well locations with aquifer characteristics in the other three counties . The data was gleaned from Virginia Department of Health paper well records located in the local health department. The well database used latitude and longitude coordinates for locating the point locations for the wells. SAIF Water staff wanted a even distribution of data points throughout the county, so they researched one well in each of the county's tax maps. When these points were plotted using the coordinates given, the locations were not accurate. Some points were more than one mile off from where they belonged. NNPDC staff perused the database and noticed that E911 street addresses were included for most well location records. Since the NNPDC has E911 address points for each of the four counties, NNPDC staff decided to recreate the inaccurate latitude-longitude points using the local counties E911 address points to locate the well locations. The accuracy of the points was vastly improved and only a few well locations did not have E911 street address data. Maps were created showing the wells in each of the four counties as well as a breakdown of the distribution of wells amongst the six known aquifers in the region. In addition, the aquifer with the most Northern Neck (as well as Southern Maryland) wells tapping it, the Piney Point Aquifer, was highlighted with its own map depicting the location of wells and the geographic distribution of these data points.

Since the Northern Neck region is entirely dependent on groundwater, the NNPDC supports many efforts relating to groundwater quality and quantity. This four county well map with aquifer information will be valuable for future efforts in conserving and protecting the regions groundwater.

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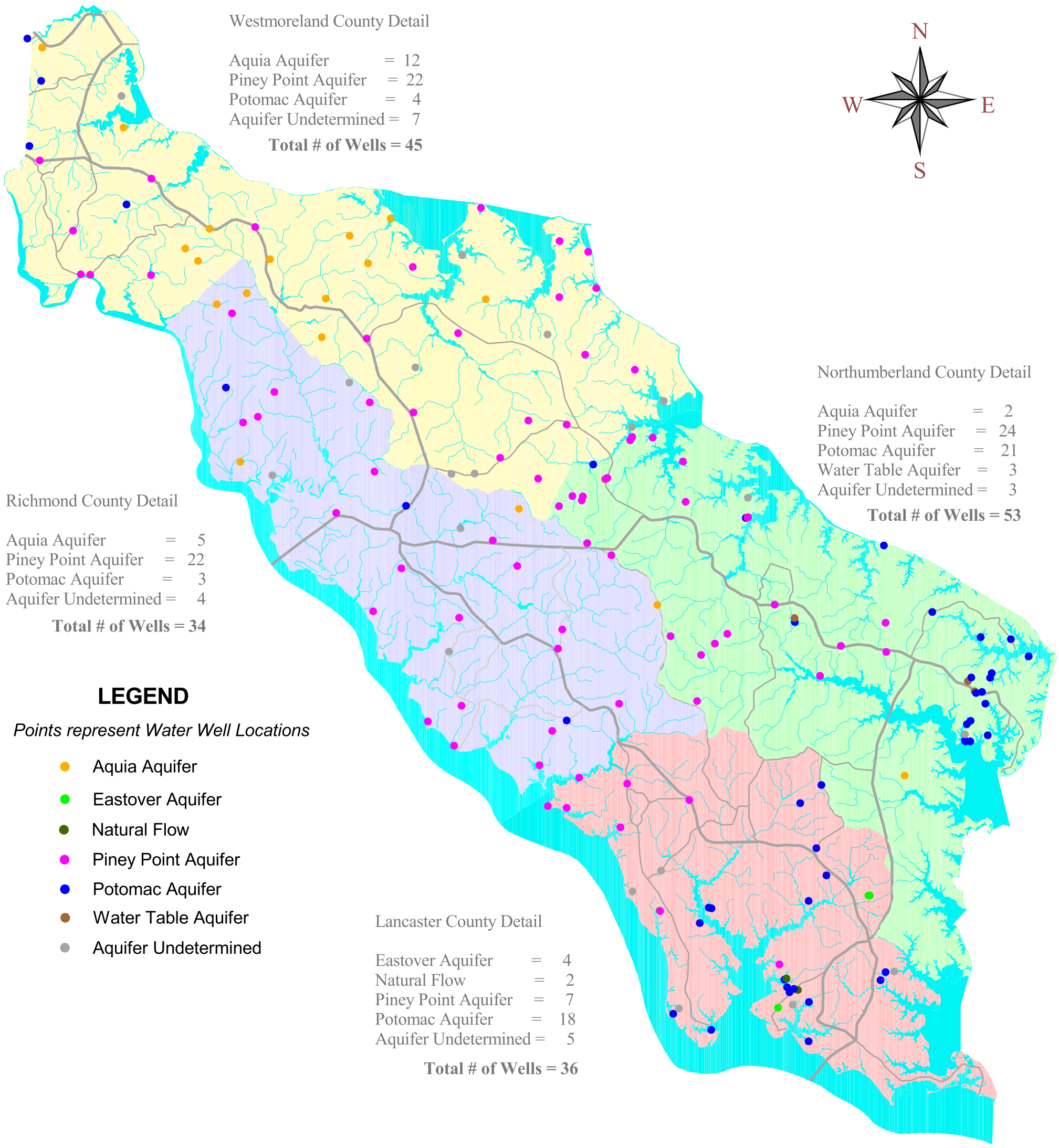
SAIF Water Aquifer Well Records Study
Northern Neck Counties



Westmoreland County Detail

Aquia Aquifer = 12
Piney Point Aquifer = 22
Potomac Aquifer = 4
Aquifer Undetermined = 7

Total # of Wells = 45

Northumberland County Detail

Aquia Aquifer = 2
Piney Point Aquifer = 24
Potomac Aquifer = 21
Water Table Aquifer = 3
Aquifer Undetermined = 3

Total # of Wells = 53

Richmond County Detail

Aquia Aquifer = 5
Piney Point Aquifer = 22
Potomac Aquifer = 3
Aquifer Undetermined = 4

Total # of Wells = 34

LEGEND

Points represent Water Well Locations

- Aquia Aquifer
- Eastover Aquifer
- Natural Flow
- Piney Point Aquifer
- Potomac Aquifer
- Water Table Aquifer
- Aquifer Undetermined

Lancaster County Detail

Eastover Aquifer = 4
Natural Flow = 2
Piney Point Aquifer = 7
Potomac Aquifer = 18
Aquifer Undetermined = 5

Total # of Wells = 36

Virginia Coastal Zone MANAGEMENT PROGRAM

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SAIF Water Aquifer Well Records Study
Piney Point Aquifer Wells
Northern Neck Counties

LEGEND

Points represent Water Well Locations

- Piney Point Aquifer

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Local Planning Coordination

The Northern Neck Planning District Commission accomplishes the local planning coordination subtask with quarterly Northern Neck Land Use Administrator Meetings, attended by local planning directors and zoning administrators. These meetings typically involve some type of training component, an update on regional grant activities and a open roundtable forum of local zoning and planning directors to discuss any issues that have arisen since the last meeting. Local planning staff from the four counties often face the same type of issues, whether they be state mandates, developer problems or staffing shortages. The local planning coordination provided by the NNPDC allows staff from neighboring jurisdictions to exchange notes and learn from each other's experiences.

At the first quarterly Northern Neck Land Use Administrator's meeting held on March 10, 2010, staff from the Virginia Department of Conservation and Recreation, Division of Chesapeake Bay Local Assistance provided training on Phase III of the Chesapeake Bay Act regulations. Phase I of the Chesapeake Bay Act regulations consisted of the designation of Chesapeake Bay preservation areas and adoption of the performance criteria by the locality. Phase II of the Chesapeake Bay Act consisted of local governments reviewing and revising their comprehensive plans, as necessary, for compliance with the provisions of the act. Phase III, which has not been implemented or enforced consists of local governments reviewing and revising their land development regulations and processes, which include but are not limited to zoning ordinances, subdivision ordinances, erosion and sediment control ordinances, and the plan development review process, as necessary, to comply with of the Chesapeake Bay Preservation Act. One of the assessments required in the act is to notify all agricultural landowners in the locality that are in a Resource Protection Area or Resource Management Area of the requirement that the landowner have an up-to-date nutrient and sediment agricultural conservation plan in place for any land that is farmed.

At the meeting, there was lively discussion on how to gather the information necessary to determine whether land is in agricultural production, what the defining criteria might be, and whether local county officials are behind such an effort. Many local county staff present noted that this requirement of the Chesapeake Bay Act offers many of the same issues that were connected to the septic pumpout requirement that was most recently implemented throughout the Virginia Chesapeake Bay Act localities. One of those issues is determining which citizens have the resource (either septic tanks or agricultural lands) and how to contact landowners and gather pertinent information (and keep up-to-date). Other county staff mentioned that this is yet another unfunded mandate that the state has imposed on the localities, requiring them to set up yet another monitoring program. DCR-DCBLA staff responded that this requirement has been known and part of the regulations in the 1990 adoption of the act, and that DCR-DCBLA is undertaking this effort as a long term project, and will work with the localities as much as possible to reduce the burden of implementing this program.

NNPDC staff mentioned that past VACZM technical assistance grant deliverables might be able to help the counties with implementation of this part of the Phase III of the

Chesapeake Bay Act. The NNPDC created the Northern Neck farm inventory in 2000 with Virginia Coastal Zone Management Program funds as well as local funds. The Northern Neck farm inventory is a GIS layer for each county that has polygons around known cultivated agricultural fields. The outlines were digitized from Farm Service Agency (FSA) maps in 1999 and are the exact same outlines that the Natural Resources Conservation Service (NRCS) uses to classify landowners and farm field. NNPDC staff further explained that by using GIS, a cross listing of the farm fields can be compiled from the counties digital tax maps with ownership information to create a mailing list to notify the landowners. NNPDC staff noted that there are some issues to contend with, such as the age of the data which is over 10 years old, and the FSA's restricted access to such data due to national security concerns that were implemented after 9/11. Therefore there is little likelihood of being able to update the data with coordination from FSA or NRCS. With those issues in mind, the Northern Neck farm inventory is a useful tool, and with up to date Virginia Base Mapping Program's aerial photos the inventory is capable of being updated, albeit without FSA help. Lancaster County staff agreed to the creation of an agricultural lands mailing list with the FY 2010/2011 Northern Neck VACZM Technical Assistance Grant, using the Northern Neck farm inventory data and the county's digital tax maps

The second quarterly meeting was held on June 14, 2010. The main topic of this meeting was suggested by staff of Northumberland County because they had just encountered a troubling issue with a project in the county. The placement of alternative septic systems in wetlands is becoming a real problem in coastal Virginia. During the 2008 Virginia General Assembly Session HB1166 was passed. The law states that the Virginia Department of Health (VDH) must accept an onsite sewage system designed by a engineer certified to operate in Virginia. Basically the law removed the power of VDH to deny an onsite wastewater system that might pollute nearby surface or ground water.

The site that raised concern (over the implications of the new law in Northumberland County) had standing water on the ground when county staff visited the site. Clearly, when water is standing on the surface of the ground, the water table is above the level of the soil. This means that any type of pollution on the ground can easily travel into the groundwater. Northumberland staff then learned that it is possible (and perfectly legal) to install an engineered onsite wastewater system on this site, when common sense dictates that this site should not be developed. Attending the June 14 meeting were staff from the Army Corps of Engineers (ACOE) and a representative of the Virginia Department of Health. The Army Corps of Engineers staff person noted that they have a very strict protocol to determine if land is a wetland (outlined in the 1989 Wetland Delineation Manual). To be classified as a wetland by the Army Corps of Engineers, the site must have 1) hydrophytic vegetation (on the certified list of wetland species), 2) hydric soils (as classed by the USDA Soils Survey), 3) hydrology (wetland soil color indicative of anaerobic soil activity). If the site does not exhibit all three criteria, then it is not a wetland. The Army Corps of Engineers staff person added that there is an exception to developing wetlands, if the site is less than 1/10 of an acre, then no permit is needed from the Army Corps of Engineers; however, a permit might be required by the Virginia Department of Environmental Quality.

The ACOE staff person noted that although HB1166 was not intended to allow onsite systems in wetlands, this indeed is what has happened. The ACOE staff person noted that the problem is much more prevalent in the Middle Peninsula county of Mathews. The ACOE staff person noted that Mathews County had considered actions to reduce the prevalence of engineered onsite septic systems on or proximate to wetlands. One of these protocols considered was to flag any development located in hydric soils for review by Army Corps of Engineer staff. This would help screen out the sites that might be problematic for development (and subsequent installation of an engineered septic system). The VDH staff person acknowledged that this HB1166 has created a loophole that circumvents the established protocol for protection of public health, but that it is the law, and it must be followed. ACOE staff noted that there is currently litigation working through the legal system to deny any onsite wastewater system on a site where standing water is present. Obviously this case will be watched closely.

After the meeting, local county staff all agreed that HB1166 was probably not intended to allow onsite wastewater systems in wetland and wet areas; however this is what has happened. VDH staff noted that the state emergency regulations for alternative onsite systems are being revised, and perhaps some language regarding standing water on a site might be inserted to help eliminate placing development in these sensitive areas that are connected to groundwater.

The third quarterly Northern Neck Land Use Administrator's meeting was held on August 30th, and the main topic of training was the Bay TMDL and the implications to local governments. While all local planning staff were aware of the Bay TMDL, none were familiar with Virginia's Watershed Implementation Plan (WIP), Phase I, which is due in final form to EPA on November 29, 2010. The WIPs from all Bay states will be used as a basis to write the Bay TMDL, which will be completed by December 31, 2010.

NNPDC staff has been involved with the formulation of the WIP, as the Virginia Association of Planning Districts rural representative to Virginia's Stakeholder Advisory Group (SAG). NNPDC staff outlined the main components of the WIP, and although the draft WIP was not final, some of the implementation measures were deemed to be somewhat draconian. One premise of Virginia's WIP was that to not include any wastewater treatment plan upgrades, stating that the point source community had done their fair share of reducing nutrients in previous years, and that it was not appropriate or equitable to ask them to upgrade the plants "when the concrete from the last upgrade has not even finished drying yet." Therefore, the draft WIP relies on getting all the nutrient reductions from the non-point source pollution side, which is the most difficult sector to get reductions from because the majority of the land where this pollution runs off is privately owned. Two measures put forth in Virginia's draft WIP were to retrofit 10% of highly impervious area with low impact development stormwater infiltration methods to reduce stormwater runoff and to retrofit currently functioning conventional septic systems with de-nitrifying systems. If a person chose not to replace their conventional septic systems, then they would be required to pay a fee into a fund to keep using the conventional nitrogen emitting onsite septic systems. This fund, in turn, would be used to

reduce pollution elsewhere in the Commonwealth, as well as to retrofit conventional septic systems with de-nitrifying systems for those who are interested.

The reaction of local county planning staff was that these measures will never work in Virginia and that there will be tremendous backlash from property owners when told they will have to pay to reduce impervious areas or to continue to use their properly functioning conventional septic systems. In addition, local planning staff noted that with the current state of the economy, most of these measures will drive up the cost of development, slowing the return to profitable economic times. Finally, local planning staff asked, "Who is going to implement all of these programs?". When NNPDC staff mentioned that the conventional septic system nitrogen fee fund was discussed to be implemented at the county level, county staff again repeated the unfunded mandate idea. Local planning staff mentioned that the state wants the local government to initiate programs that were begun at the state level, while at the same time reducing the financial support to keep even existing programs functional at the local level.

As evident from the above description, there is a disconnect between the state and local governments with regards to the Bay TMDL. NNPDC staff is attempting to get local governments up to speed with regards to the Bay TMDL, however, there is little interest in preparing for increased environmental regulation.

The final Northern Neck Land Use Administrator's meeting was held on September 28th, 2010, and the main discussion topic was a software modeling package called Community VIZ. The Community VIZ software is an extension to the ArcGIS software package and is used to help community leaders evaluate various planning tools that effect development within their county. Community VIZ can be used to estimate groundwater withdrawals, eventual community buildout scenarios, as well as estimate the impacts of changing the parameter of local zoning laws.

A staff person from VCU with extensive experience with the software presented at the meeting, first giving an overview of the capabilities of the software, with examples of local projects that Community VIZ was used to help evaluate scenarios. After the VCU staff person finished her overview presentation, several local planners noted that the software could be quite useful. One county staff person noted that this software would be especially helpful for a large development project currently proposed in the county, as there were many question from citizens, elected officials and county staff about the impact of the large development on groundwater resources and traffic implications.

Before the meeting ended, NNPDC staff noted that the presenter would be returning after lunch to do some hands on training with the software if any local planning staff wished to participate. Two local planning staff members chose to attend the afternoon training session to learn more specific information on how to use the software. NNPDC staff noted that in the upcoming VACZM 2010/20011 technical assistance grant the Community VIZ software would be used to help create a buildable areas map for Richmond County and to do a buildout scenario of one of the primary growth areas in

Westmoreland County. NNPDC staff reiterated that these two projects were pilot projects so that NNPDC staff could become more familiar with the software and its capabilities. On a larger planning coordination level, NNPDC staff participated on the Rappahannock River Basin's Non-Point Source Working Group (RRBC-NPWG). While the main mission of the RRBC-NPWG was to help identify ways to engage the private sector into nutrient reducing activities, most of the recent meetings have dealt with the state and the development of the Phase I Watershed Implementation Plan for the Commonwealth.

In addition, NNPDC staff continue to participate with the counterpart for the Rappahannock River Basin Commission, the Potomac Watershed Roundtable. NNPDC staff were instrumental in coordinating the most recent meeting at Westmoreland State Park and provided suggestion for all of the speakers and topics discussed at that meeting. NNPDC staff participate in the Northern Virginia-dominated Potomac Watershed Roundtable to highlight the fact that the Northern Neck region is downstream and has to deal with all of the pollution they create, as well as to reiterate the fact that not all of the Potomac Watershed is ultra urban as is Northern Virginia.

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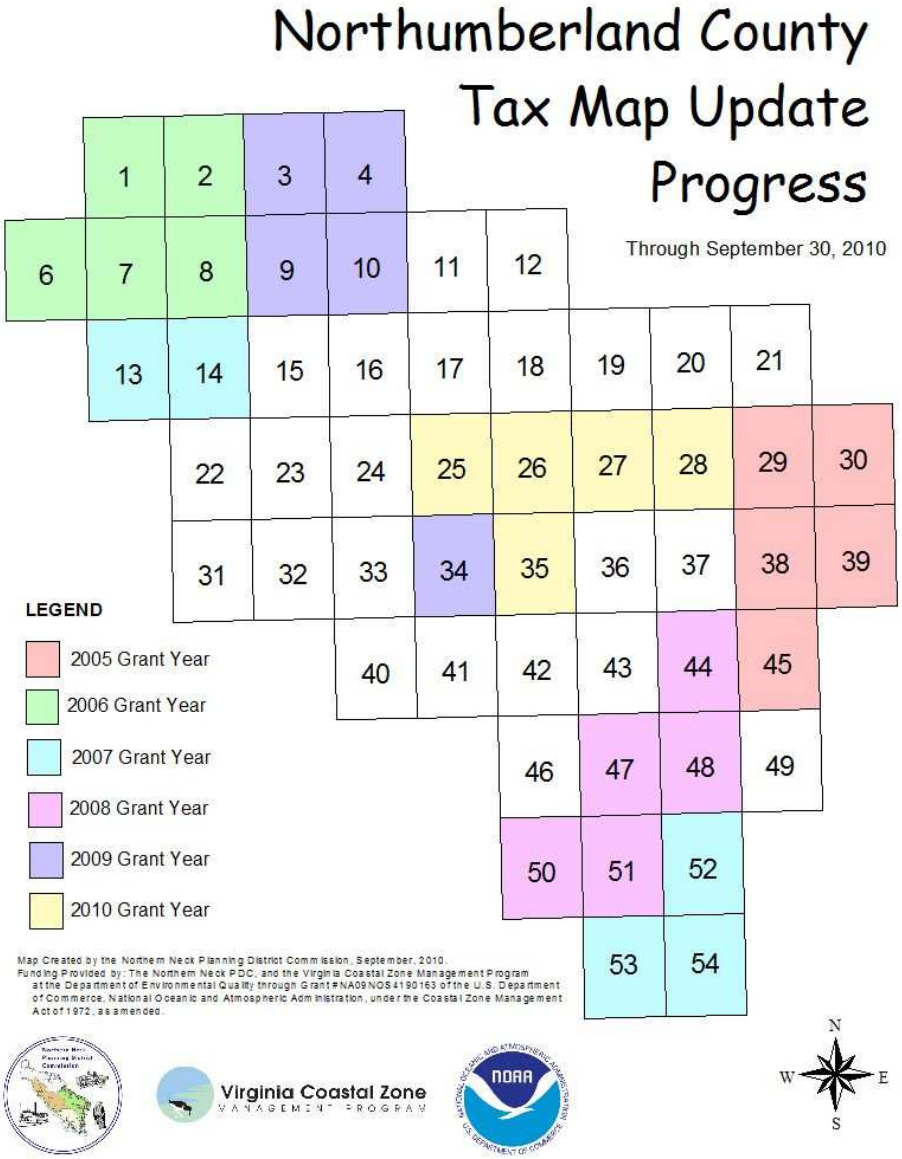
Northumberland County Five Revised Digital Tax Maps

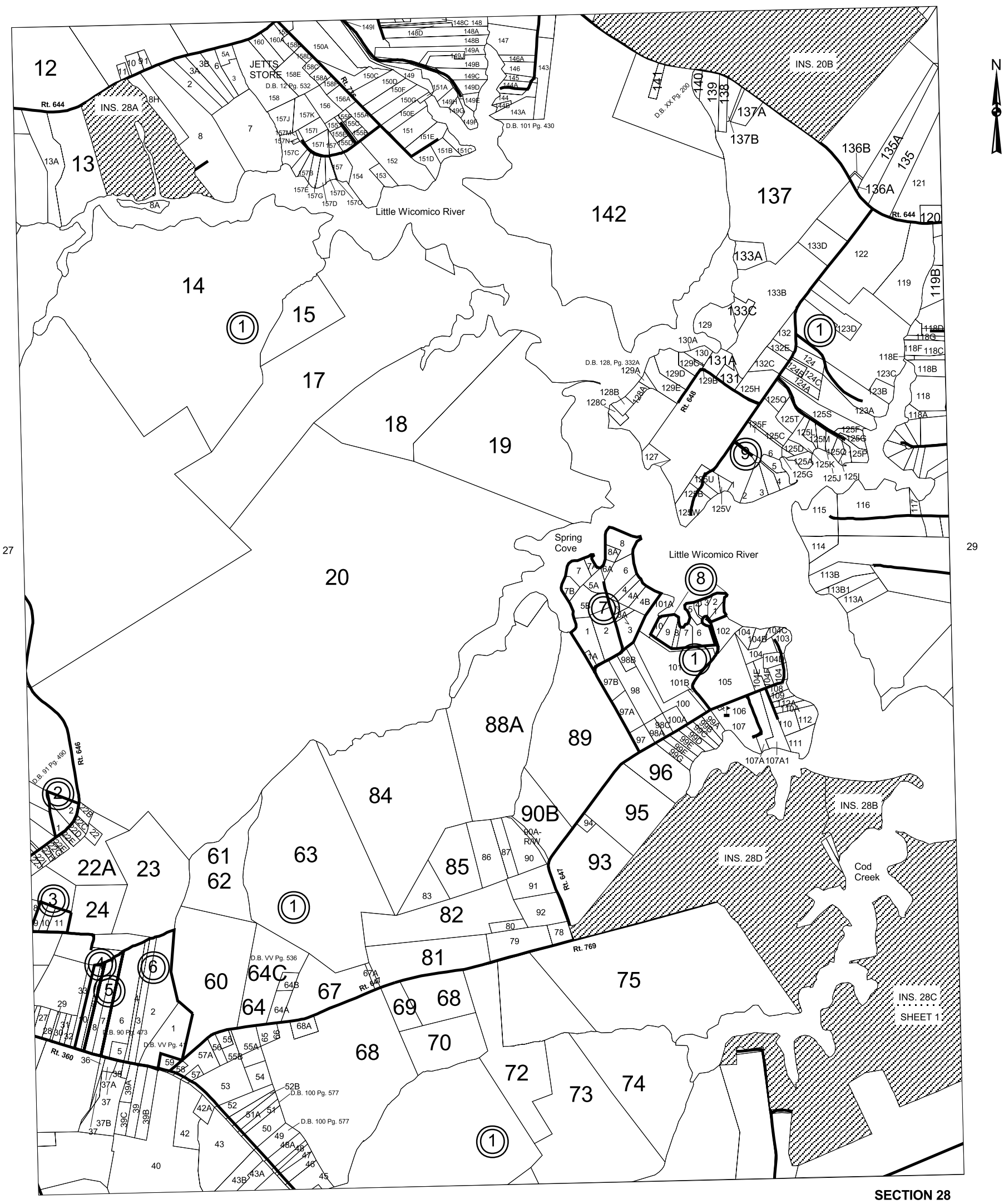
NNPDC staff have been updating Northumberland Counties tax maps since 2005. The existing digital tax maps are being revised using Virginia Base Mapping Program's 2009 Aerial photography. Northumberland County has chosen this approach to update their digital tax maps to reduce the cost of having the maps revised by an outside vendor. NNPDC staff have extensive experience with digital tax maps revision, and was employed by the vendor that created the first digital set of tax maps for the county. This grant year, the five tax maps that were revised were 25, 26, 27, 28 and 35. *(Due to file size limitations, only two of the five revised digital tax maps are included).*



Northumberland County Taxmap 28 - Example of Revisions Made

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 #NA09NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended.

NORTHUMBERLAND COUNTY



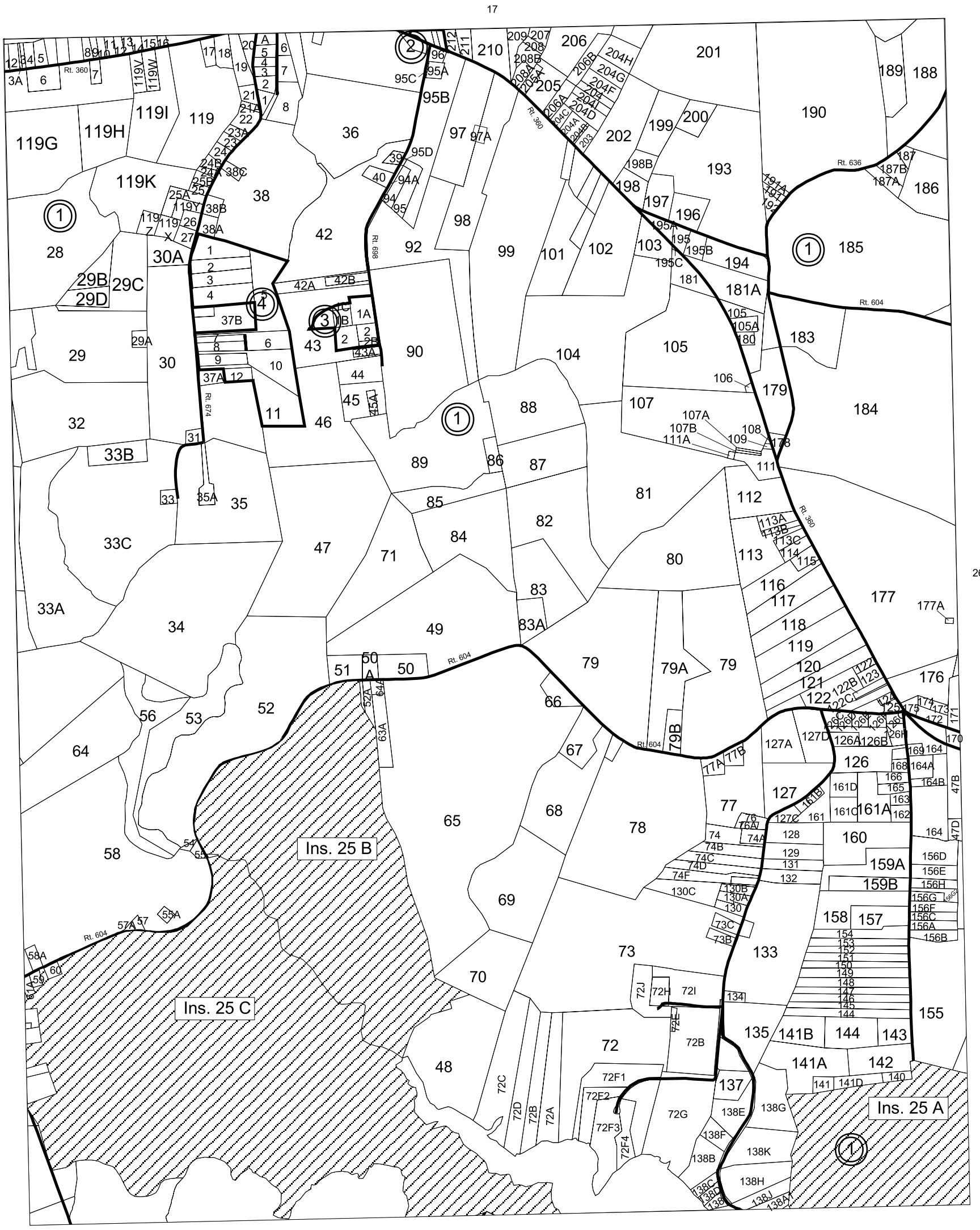
SECTION 28
INSERT
AUGUST 2010

FAIRFIELD DISTRICT

Virginia Coastal Zone
MANAGEMENT PROGRAM

Map Created by the Northern Neck Planning District Commission, August 2010.
Funding Provided by: The Northern Neck PDC, and the Virginia Costal Zone Management Program at the Department of Environmental Quality through Grant #NA09NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended.

NORTHUMBERLAND COUNTY



SECTION 25 INSERT

600 0 600 1200 1800 Feet

HEATHSVILLE FAIRFIELD DISTRICT

Virginia Coastal Zone MANAGEMENT PROGRAM

Map Created by the Northern Neck Planning District Commission, September 2009.
Funding Provided by: The Northern Neck PDC, and the Virginia Costal Zone Management Program at the Department of Environmental Quality through Grant #NA06NOS1490178 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended.

Northern Neck Regional Coastal Storm Surge Hazard Assessment

The Virginia Department of Emergency Management (VDEM) created new hurricane storm surge maps for the coast of Virginia in 2007. Lessons learned from Isabel, which was only a tropical storm when it hit Virginia in 2003 proved that worst case scenarios do happen when tropical storms or hurricanes impact Virginia. Isabel caused widespread damage in the Commonwealth, and the storm surge rivaled that of the Great Hurricane of 1933 that brought devastation to the majority of Virginia's coast.

The Virginia Department of Emergency Management used the worst case scenario when creating the new storm surge maps. VDEM's rationale was that it was better to err on the side of caution than to underestimate the impacts (which many say happened with Isabel). The worst case scenario is a combination of factors that help to intensify the effect of tropical storms or hurricanes. The combination includes a storm track that exposes the main stem of the Chesapeake Bay to the right front (usually with Virginia storms, the North East) quadrant of the storm. The right front quadrant of a tropical storm or hurricane is the most powerful quadrant of storm because the forward motion of the storm amplifies wind speed, while the counter clockwise rotation of the winds adds to the effect. Also the storm would arrive at the daily astronomical high tide cycle, further increasing the impacts caused by the storm surge. All of these factors combine to increase the relative intensity of the storm surge onto land. In addition to creating static maps, VDEM also provided GIS data layers of the storm surge, which were used in this assessment.

The Northern Neck Regional Coastal Storm Surge Hazard Assessment is an attempt by the NNPDC to quantify the monetary impact to real estate improvements of a category 1 hurricane storm surge throughout a county's coastline. By using county E911 building structure outlines, overlain with the VDEM storm surge model maps using a Geographic Information System, an estimate of the total assessed value of real estate improvements (structures, boathouses, docks) that could be impacted, and those that could be inundated can be made. There are many assumptions inherent in this analysis, and one of the more prominent ones is that, for this analysis, the E911 structures are considered to be constructed at ground level, e.g. that the buildings floor is level with the ground. This assumption means that if any part of the building is located in the storm surge area, the structure is considered to be inundated in that area. Obviously, most houses are built on raised foundations, however there are houses in the area that are built on concrete slabs which would be very close to ground level. Other assumptions that were encountered during the project will be discussed below.

NNPDC staff contacted each of the four counties for the latest copies of their E911 building structures, address points, and digital tax maps. When beginning the analysis on Richmond County, it was quickly apparent that often times accessory structures were the only structures impacted on a lot, with the primary structure being located outside of the storm surge. The posed a dilemma with estimating the real estate improvement value. The landbook database attached to the digital tax maps has only the total value for all improvements on a property, thus breaking out how much value accessory structures held

could not be accomplished. As a work around for this problem, NNPDC staff devised a simple way to estimate the impact of partial or accessory structure inundation. First, each and every parcel that had any part of a building in the inundation zone would have all buildings on that parcel combined into one feature so that each tax parcel would have one record for all the buildings present. Then the area of all the buildings on each tax parcel would be calculated. Next, the buildings would be clipped by the category 1 storm surge and the area calculated for the inundated sections of the E911 structures. Next, the area of inundated buildings for each parcel would be divided into the total area of all buildings on a parcel to get a percentage of inundation. Then the percentage of inundation would be multiplied by the total assessed value of improvements on the parcel to get an estimated value of inundated real estate improvements. An assumption with this approach to valuation of partial inundation is that the value of square footage of accessory buildings is the same as the primary residence (which, of course, is not true). However, this was deemed the best approach available to accurately reflect the value of the proportion of inundated real estate improvements on each tax parcel.

After completing the Richmond County analysis, it was discovered that two of the other three counties E911 building structure GIS layer was a line layer instead of a polygon layer. In order to calculate the area of buildings to get the percentage of inundation, it is necessary to have polygon GIS data. Fortunately, NNPDC staff were able to convert the line files into polygon files with the help of one of the member counties.

Analysis of the other three counties revealed limitations with the GIS data sets in this analysis. Several counties did not actually outline the building footprint but rather relied on rectangles or squares to depict structures. Thus a house that might be L-shaped would not have the footprint accurately represented by a rectangle. Furthermore, some counties had structures' outlines accurately depicted in the original E911 project, but the subsequent updates added by the county used rectangles instead of accurate outlines. Also, the accuracy of the location of E911 structures is not consistent. NNPDC staff hypothesizes that different methods of data collection, as well as different staff collecting this data contributes to the inconsistency of building location placement accuracy.

Another problem with the data is the differing shoreline configuration of the VDEM storm surge data versus the county tax maps. The county's tax maps use the shoreline from recent aerial photos (or from the original tax map shoreline from the 1970's). Thus, the shorelines rarely line up properly with one another. Often times a tax map shoreline and the VDEM storm surge shoreline will meander at a different rate. Thus the storm surge, in some instances, will begin much further inland than where the actual shoreline occurs, which will overestimate the amount of inundation as a result of the incorrect position of the originating shoreline. Conversely, the opposite occurs, and in that case, the storm surge is located out in the waterbody. A final problem that affects the shoreline is that in high erosion rate areas, such as the western shoreline of the main stem of the Chesapeake Bay, the shoreline has eroded by tens to hundreds of feet, thus the VDEM storm surge is located far offshore, which does not accurately represent the storm surge impact to the remaining land.

Aside from the limitations of the GIS data outlined above, the analysis did confirm storm surge problem areas in each of the counties that became evident after Isabel. Poplar Neck next to Fleets Bay in Lancaster County, Lewisetta and Ditchley in Northumberland County, Little Florida at the mouth of Farnham Creek in Richmond County, and Narrows Beach that juts out into Lower Machodoc Creek in Westmoreland County. Some of these areas are depicted in the inset maps for each of the four Counties. NNPDC staff believe that the results of this analysis are useful to the counties in assessing the vulnerability of each county in the Northern Neck.

The results of the county estimate of value of impacts to real estate improvements from a category 1 hurricane storm surge are in the table below.

County	Potentially Impacted Real Estate Improvement Assessed Values*	Potentially Inundated Real Estate Improvement Assessed Values**
Lancaster County	$163,335,680	$110,036,647
Northumberland County	$105,917,402	$64,100,614
Richmond County	$6,771,520	$2,364,273
Westmoreland County	$31,458,805	$519,411

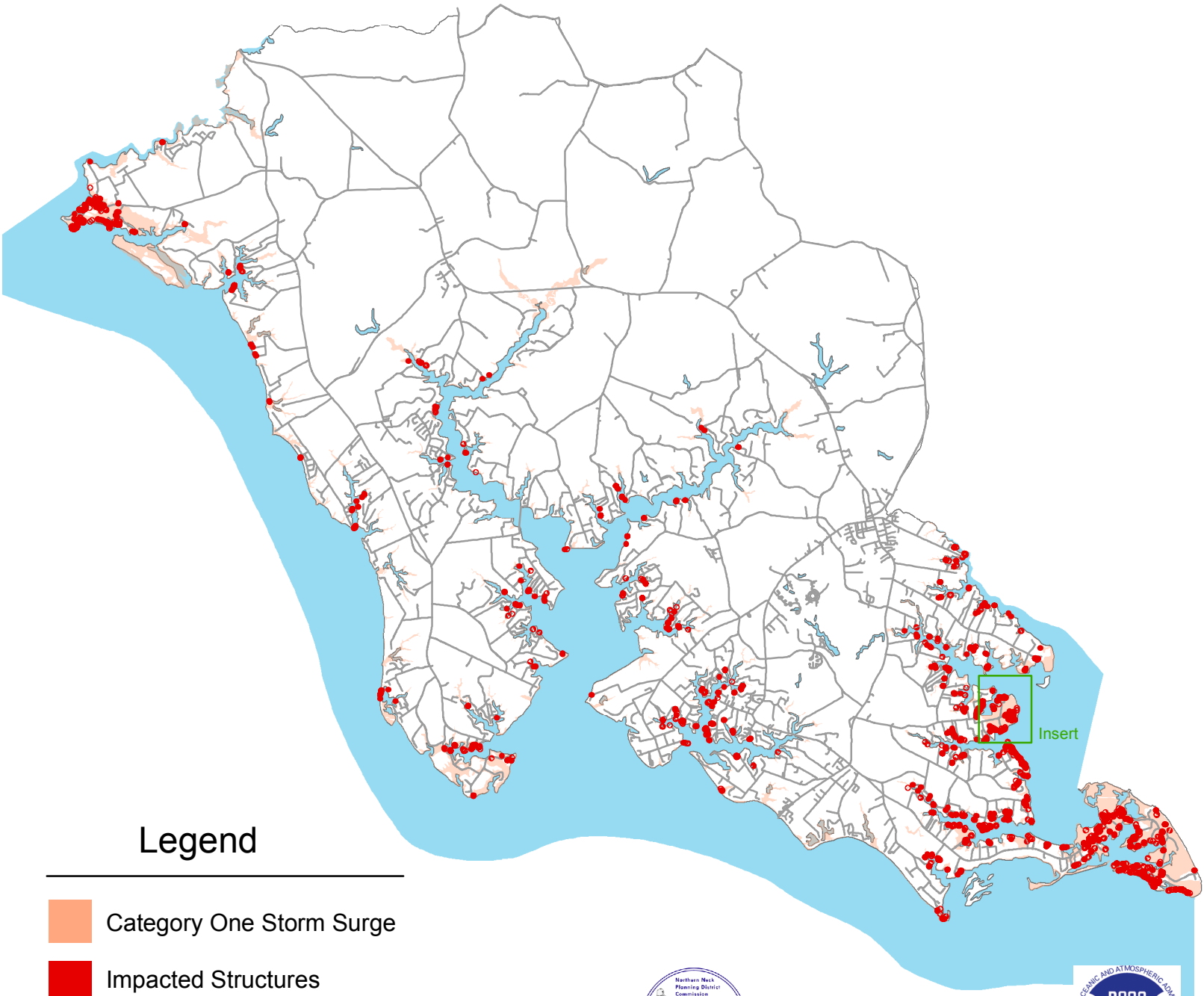
* Potentially Impacted Real Estate Improvement Assessed Values - the total assessed value of all improvements that have at least some area of the improvements within the storm surge area

** Potentially Inundated Real Estate Improvement Assessed Values - the percentage of the total value for only those portions of buildings within the storm surge area

The storm surge impact analysis shows that the counties closest to the Chesapeake Bay have more waterfront residential development that is vulnerable and some of that the development is located on lowlands. Richmond and Westmoreland County have more topography, and towards the upstream areas of the both counties (on the Rappahannock River for Richmond and the Potomac River for Westmoreland) have cliffs where storm surge has little impact on real estate improvements.

This Northern Neck Coastal Storm Surge Impact Analysis is hoped to be included in the revision to the Northern Neck PDC's All Hazards Mitigation Plan to be completed in the next year, as required by FEMA.

Lancaster County - Estimate of Value of Impacts to Real Estate Improvements from a Category 1 Hurricane Storm Surge



Legend

Category One Storm Surge

Impacted Structures

Lancaster County VDEM Hurricane Storm Surge Category One

Potentially Impacted Real Estate Improvement Assessed Values:
$163,355,680

Potentially Inundated Real Estate Improvement Assessed Value:
$110,036,647

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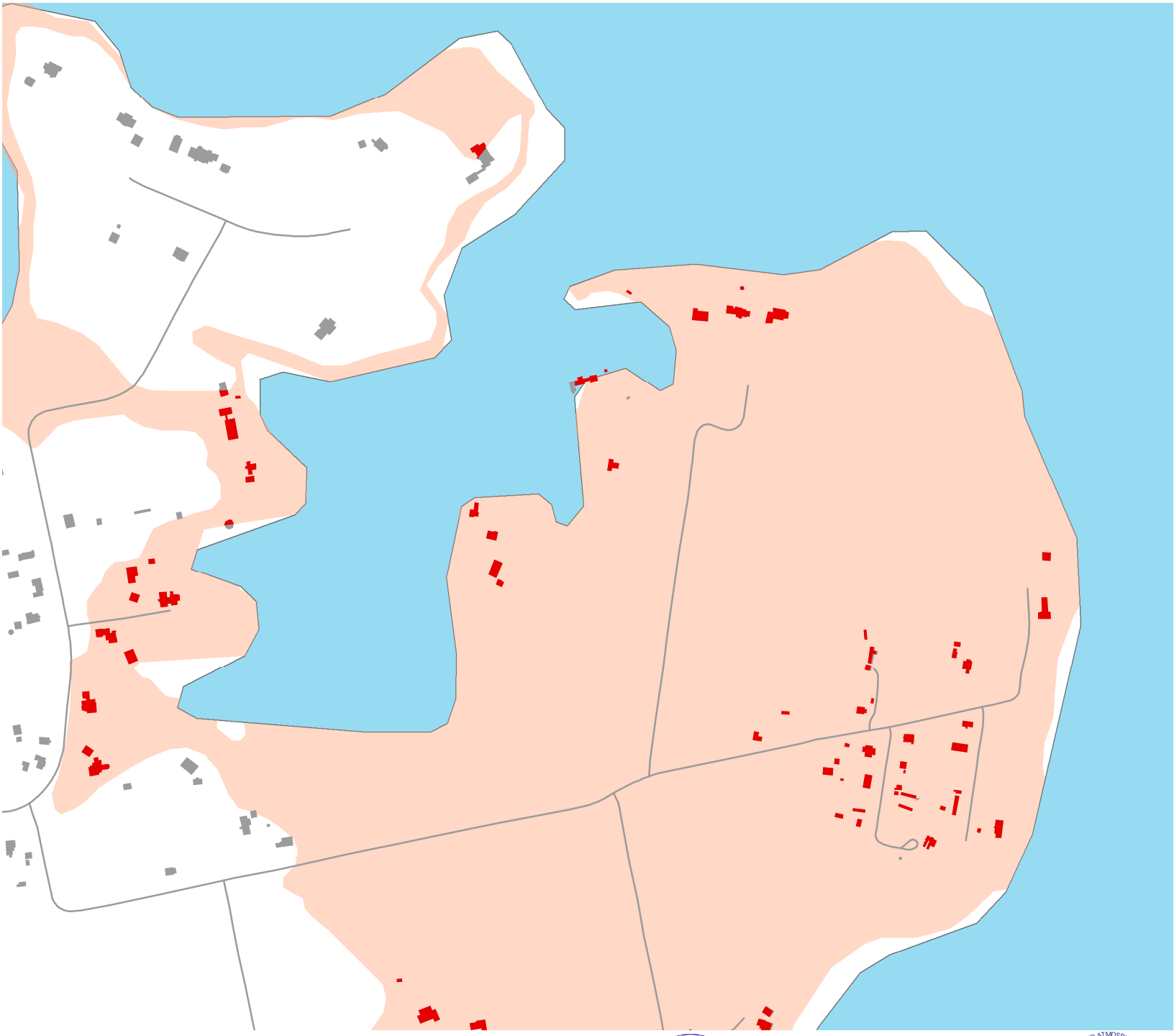
This project was funded by the Northern Neck Planning District Commission and the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant #NA09NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended.

Lancaster County - Category 1 Hurricane Storm Surge: Example of Impacts and Inundation to Real Estate Improvements - Fleets Bay



Legend

- Category One Storm Surge
- Impacted Structures
- Building Outlines

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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 #NA09NOS4190163 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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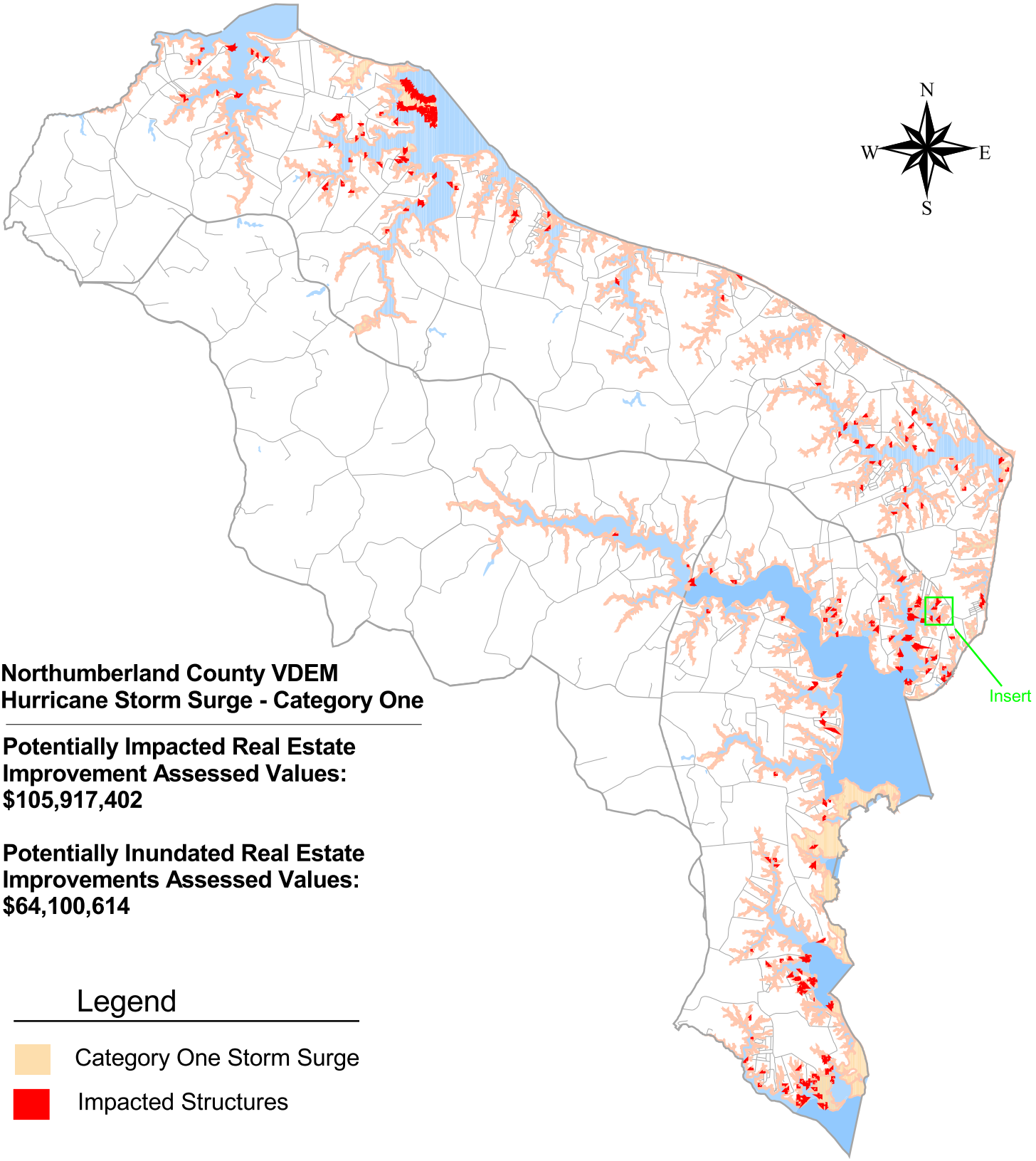
Northumberland County - Estimate of Value of Impacts to Real Estate Improvements from a Category 1 Hurricane Storm Surge



Northumberland County VDEM Hurricane Storm Surge - Category One

Potentially Impacted Real Estate Improvement Assessed Values: $105,917,402

Potentially Inundated Real Estate Improvements Assessed Values: $64,100,614

Legend

- Category One Storm Surge
- Impacted Structures

Virginia Coastal Zone MANAGEMENT PROGRAM

Map prepared October 2010.

This project was funded by the Northern Neck Planning District Commission and the Virginia Coastal Zone Management Program at the Department of Environmental Quality throught Grant "NA09NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Adminstration, under the Coastal Zone Management Act of 1972, as amended.

Northumberland County - Category 1 Hurricane Storm Surge: Example of Impacts and Inundation to Real Estate Improvements - Reedville and Cockrell Creek Area

Virginia Coastal Zone MANAGEMENT PROGRAM

Map prepared October 2010.

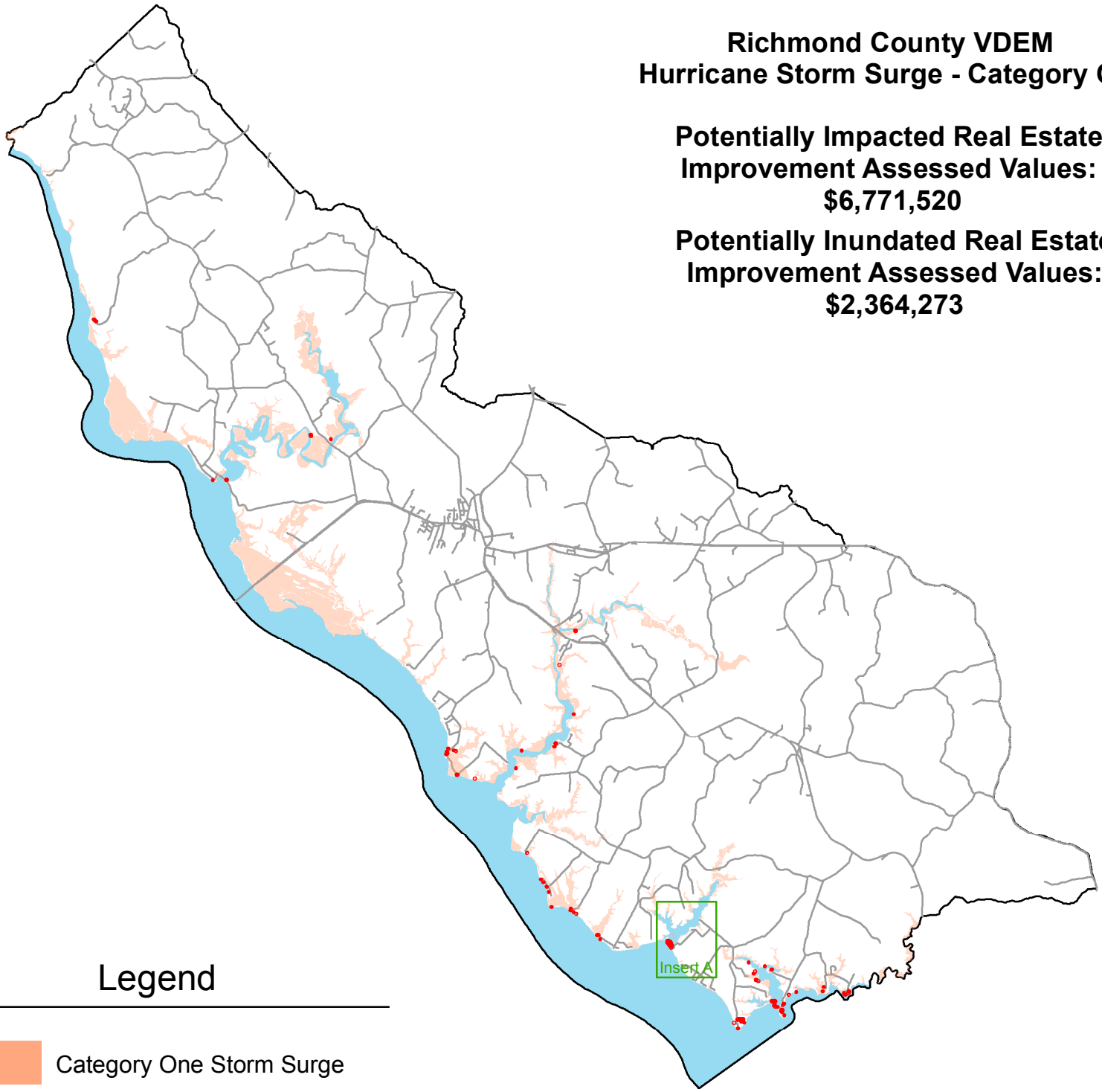
This project was funded by the Northern Neck Planning District Commission and the Virginia Coastal Zone Management Program at the Department of Environmental Quality throught Grant "NA09NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Adminstration, under the Coastal Zone Management Act of 1972, as amended.

Richmond County - Estimate of Value of Impacts to Real Estate Improvements from a Category 1 Hurricane Storm Surge

Richmond County VDEM
Hurricane Storm Surge - Category One

Potentially Impacted Real Estate Improvement Assessed Values: $6,771,520

Potentially Inundated Real Estate Improvement Assessed Values: $2,364,273



Legend

- Category One Storm Surge
- Impacted Structures

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Virginia Coastal Zone MANAGEMENT PROGRAM

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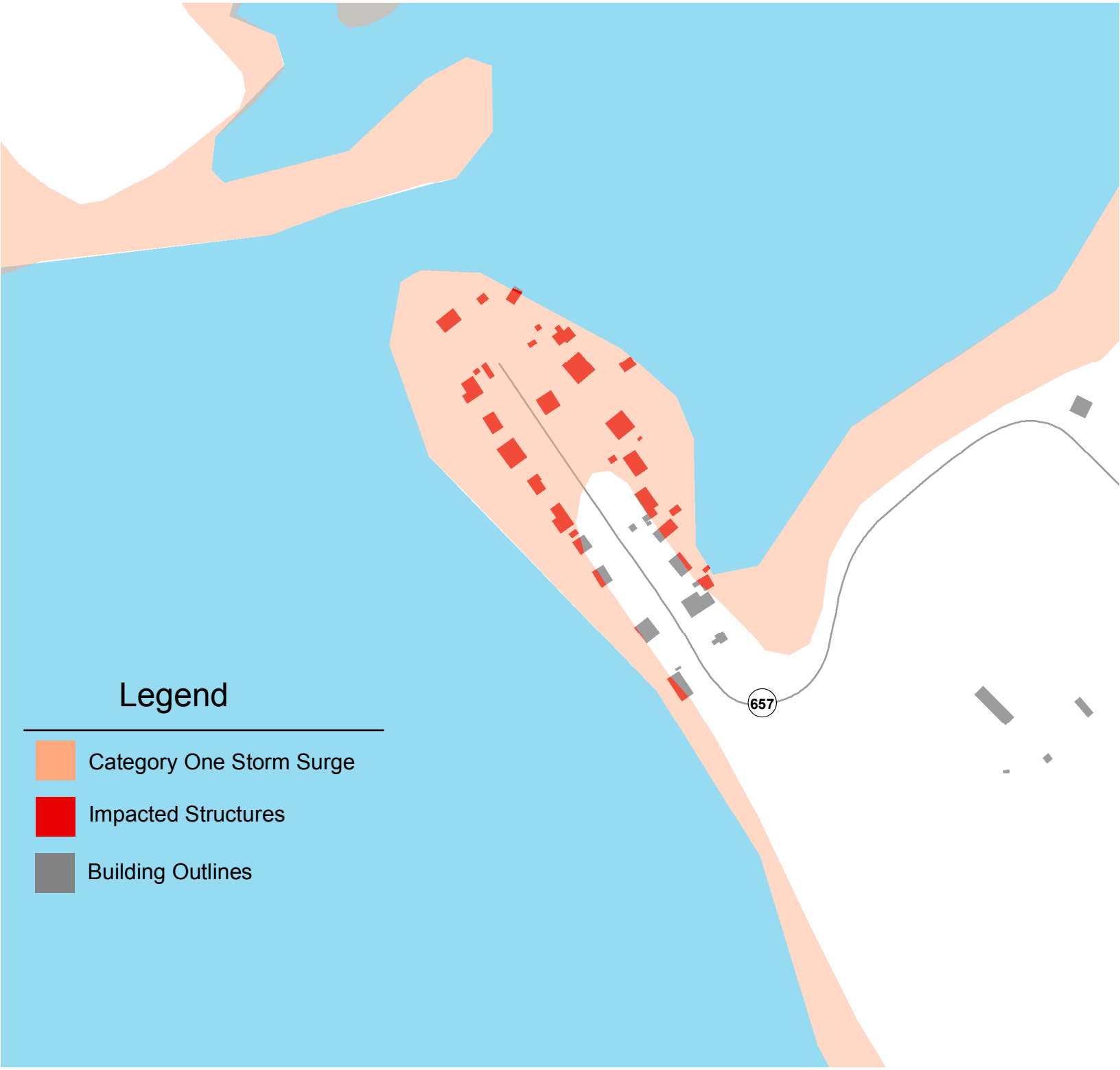
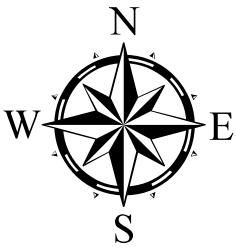
0 1.5 3 6 9 12 Miles

Richmond County - Category 1 Hurricane Storm Surge: Example of Impacts and Inundation to Real Estate Improvements - Rappahannock River and Farnham Creek Area





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Virginia Coastal Zone MANAGEMENT PROGRAM

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Westmoreland County - Estimate of Value of Impacts to Real Estate Improvements from a Category 1 Hurricane Storm Surge

Westmoreland County VDEM
Hurricane Storm Surge Category One

Potentially Impacted Real Estate Improvement Assessed Values:
$31,458,805
Potentially Inundated Real Estate Improvement Assessed Values:
$519,411

Insert

Legend

- Category One Storm Surge
- Impacted Structures

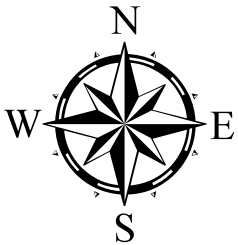
Virginia Coastal Zone MANAGEMENT PROGRAM

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 #NA09NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended.

0 1.5 3 6 9 12 Miles

N W E S

Westmoreland County - Category 1 Hurricane Storm Surge: Example of Impacts and Inundation to Real Estate Improvements- Lower Machdoc Creek, Narrow Beach



0 0.045 0.09 0.18 0.27 0.36 Miles

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 #NA09NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended.

Northern Neck Working Waterfront Inventory

Although the seafood industry has suffered some setbacks in the region due to shellfish diseases and pollution, there is still a vibrant seafood industry in the Northern Neck. The largest of these industries, Omega Protein, operates a menhaden reduction plant that is based in Reedville, in Northumberland County. Omega Protein is Northumberland County's largest employer and last year ranked third in the United States in number of pounds of fish landed, behind the ports of Dutch Harbor, AL and Empire-Venice, LA.

In addition to menhaden (for reduction and for crab pot bait), there is a thriving blue crab fishery and gill net fishery. The oyster industry in the Northern Neck is transitioning from a wild fishery to aquaculture, as many are beginning to grow oysters within cages to protect them from siltation and predation.

Historically, the Northern Neck has also been home to notable shipbuilding industry. There are still shipbuilders in the region, most notably Tiffany Yachts in Northumberland County, however most boat building in the Northern Neck is more of a cottage industry run by individuals rather than by corporations.

Marinas provide important services to boaters, and are vital to maintaining, repairing and replenishing commercial seafood and recreational fleets that ply the local waters.

Lately, developers have been buying up the working waterfront areas, and redeveloping the sites for waterfront residences. One reason for this is that the Virginia Chesapeake Bay Act does not allow new development closer than 100 foot to tidal waters. However, a provision of the Act grandfathers existing building footprints within the 100 foot Chesapeake Bay Resource Protection Area. Therefore, developers are tearing down the old seafood houses to build new waterfront condominiums on the footprint of the old building (usually very close to the water). This has happened in both Westmoreland and Lancaster counties, and undoubtedly elsewhere.

In order to begin to strategize on how to help protect existing water dependent businesses in the Northern Neck, NNPDC staff have worked with local county staff to identify working waterfront sites. NNPDC staff used 2009 Virginia Base Mapping Program aerial photographs to scan the shorelines of the Northern Neck localities for potential working waterfront sites. Local knowledge of the waterways was tapped to locate some facilities, as well as some fieldwork in Richmond, Lancaster and Northumberland County via boat. Local county staff have had the opportunity to review the working waterfront data for their respective counties.

Below are some snapshots of working waterfront sites that were mapped. NNPDC staff created maps for each of the four Northern Neck counties and they follow. NNPDC staff are anticipating refining this inventory in the future in a future VACZM focal area project.

Pictures of typical Northern Neck seafood operations:

Northumberland seafood point # 41

Richmond County seafood point #2

Photos of typical Northern Neck marinas:

Northumberland County marina point #11

Lancaster County marina point # 4

Photos of typical Northern Neck boat repair/construction operations:

Northumberland County boat repair point # 22

Lancaster County boat repair point #11

Photos of Northern Neck Working Waterfront "other" category:

Lancaster County other point # 39

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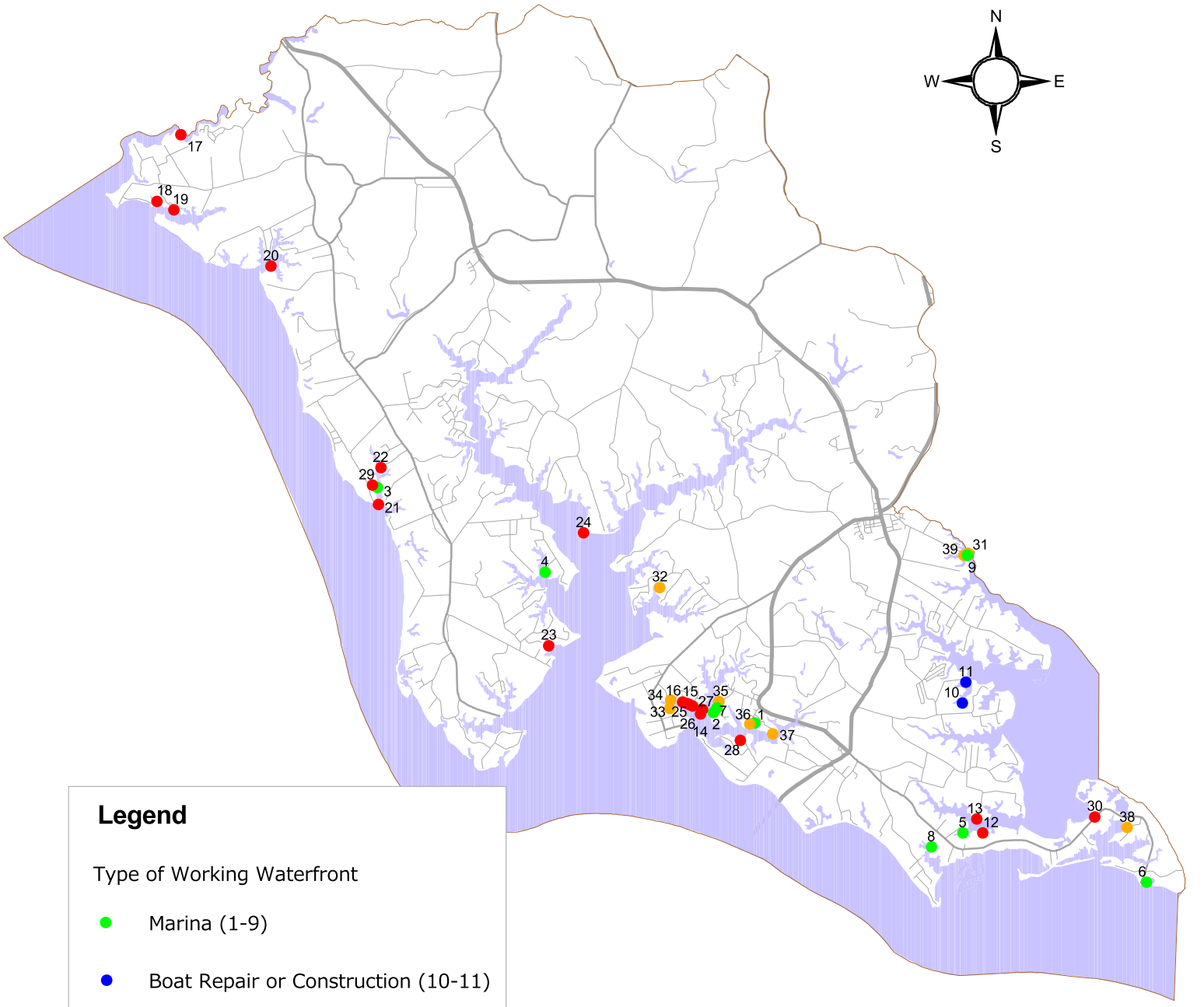
Lancaster County: Working Waterfront Locations



Legend

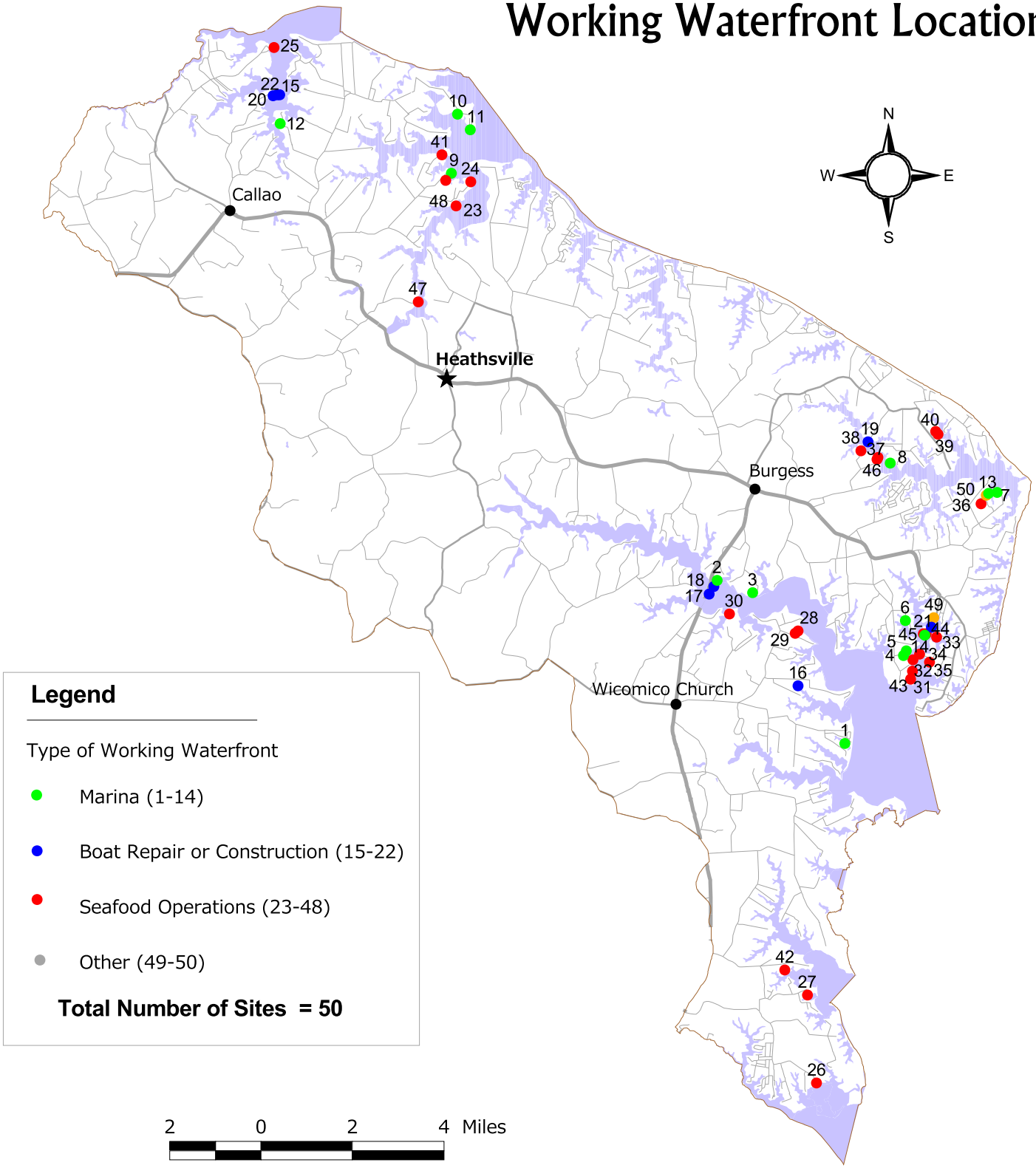
Type of Working Waterfront

- Marina (1-9)
- Boat Repair or Construction (10-11)
- Seafood Operations (12-30)
- Other (31-39)

Total Number of Sites: 39

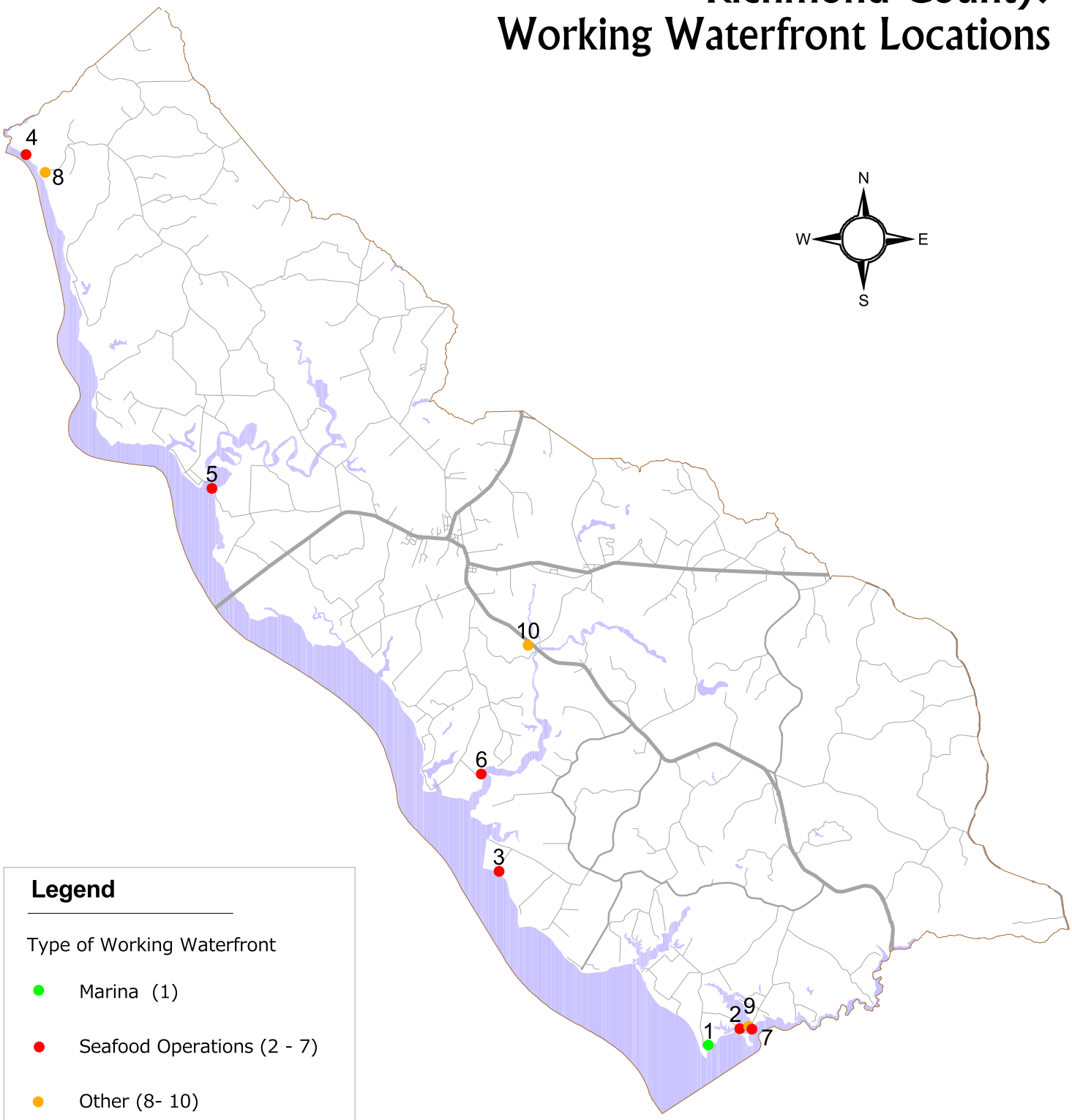
This project was funded by the Northern Neck Planning District Commission and the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant #NA09NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as ammended.

Northumberland County: Working Waterfront Locations



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 #NA09NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as ammended.

Richmond County: Working Waterfront Locations



Legend

Type of Working Waterfront

- Marina (1)
- Seafood Operations (2 - 7)
- Other (8- 10)

Total Number of Sites = 10

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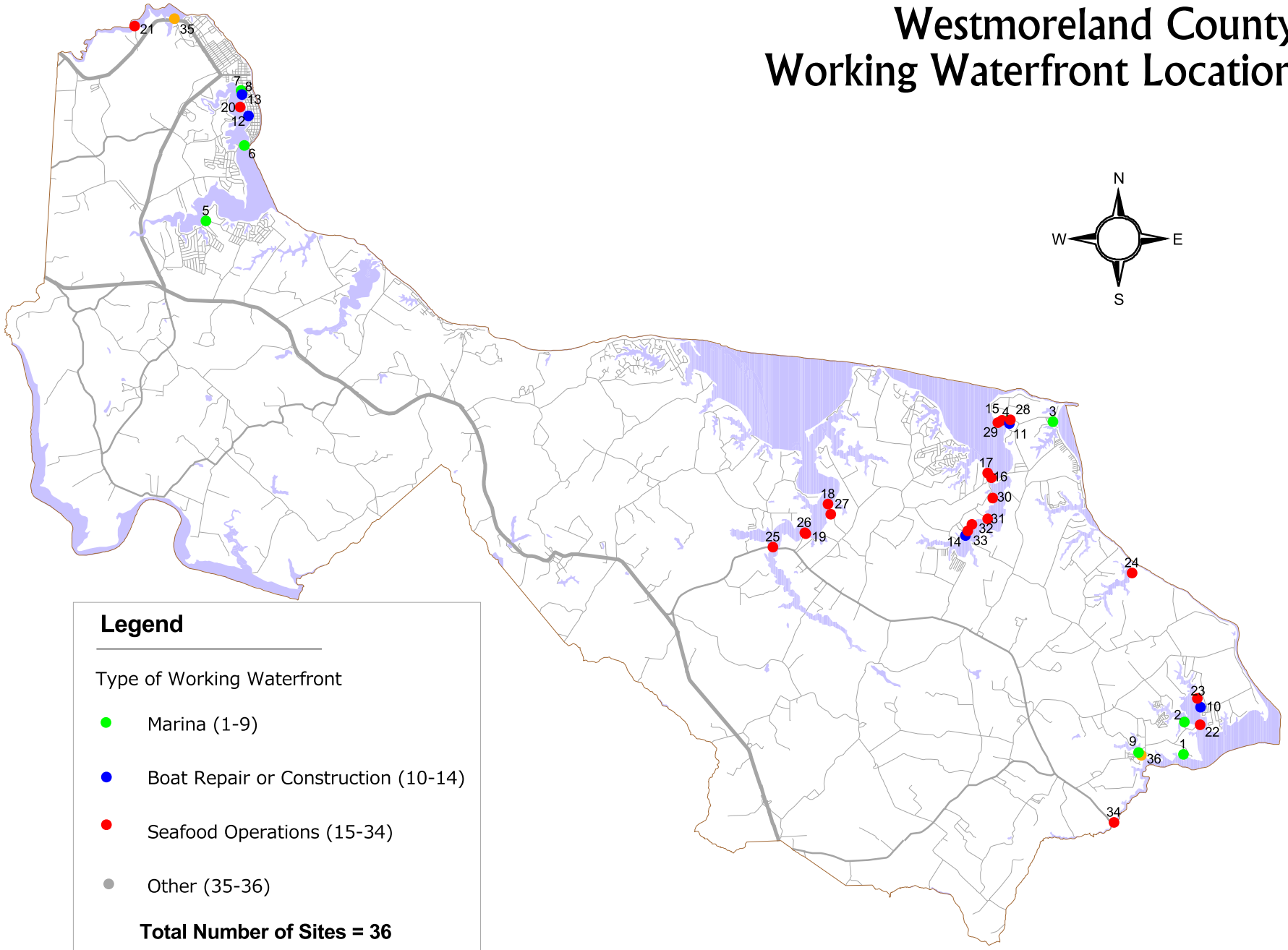
Westmoreland County: Working Waterfront Locations



Legend

Type of Working Waterfront

- Marina (1-9)
- Boat Repair or Construction (10-14)
- Seafood Operations (15-34)
- Other (35-36)

Total Number of Sites = 36

2 0 2 4 Miles

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