

Middle Peninsula Climate Change Adaptation:

Facilitation of Presentations and Discussions of Climate Change Issues with Local Elected Officials and the General Public

PHASE 2



Virginia Coastal Zone
MANAGEMENT PROGRAM

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The views expressed herein are those of the authors and do not reflect the views of the U.S. Department of Commerce, NOAA, or any of its subagencies.

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I. Executive Summary

Although climate change is a global phenomenon, local strategies to adapt and plan for climate changes will be important to protect public safety, health and welfare. With well over 1,000 miles of linear shoreline in the Middle Peninsula, there is a considerable amount of coastline that may be directly impacted by climate change. The Middle Peninsula Planning District Commission, funded through the Virginia Coastal Zone Management (CZM) Program, is in the midst of a three year endeavor working with member localities and stakeholder groups to assess and discuss potential climate change and sea level rise impacts to the region. In particular, phase I of this project focused on the collection, assessment and analysis of potential ecologic (ie. wetlands, conserved lands, etc) and anthropogenic (ie. personal property, public property, etc) impacts of climate change, specifically due to sea level rise. The information gathered during phase I acted as the foundation of information to develop an educational program for local elected official and the general public in phase II of this project.

As climate change and sea level rise still remain a very unsettled issue amongst Middle Peninsula constituents and local elected officials, Middle Peninsula Planning District Commission (MPPDC) staff developed an educational program to continue dialog about this issue and to begin to discuss local government's role in managing potential climate change and sea level rise impacts. Through the utilization of Qwizdom, an interactive software that allows for instant feedback to be obtained from audiences, MPPDC staff engaged elected officials, county staff and the general public on the topic of climate change, sea level rise, and government's role in managing potential impacts. MPPDC staff found discrepancies between stakeholder group knowledge and beliefs. However through each group interaction a better understanding of social perceptions of these issues were obtained which will assist in future educational outreach efforts.

Information gathered from phase I and II will assist continuing efforts in phase III to work toward developing adaptation public policy for the Middle Peninsula.

II. Introduction

In October 2008, the Middle Peninsula Planning District Commission (MPPDC), funded through the Virginia Coastal Zone Management (CZM) Program, began a three year endeavor working with member localities and a variety of stakeholder groups to assess and discuss climate change and sea level rise impacts.

During phase I of this project a Climate Change Advisory Workgroup, consisting of appointed county representatives and stakeholders, including transportation, sanitation, public health, recreation, scientists, planners, and local businesses, for the Middle Peninsula was established. They were tasked with identifying critical anthropogenic and ecological impacts of climate change and sea level rise to their respective sector as well as to the region. Through a series of monthly meetings, the Workgroup pinpointed specific impacts of concern which were then mapped and assessed through GIS (Geographic Information Systems). Using available topographic data, MPPDC staff generated county and regional maps to assess the economic and ecological impacts of 1 ft sea level rise by 2050 for select vulnerable areas. The assessment revealed that approximately \$187,005,132.10 - \$249,451,074.50 worth of infrastructure (ie. roads, houses, onsite disposal systems, etc) and wetland function may be impacted and/or lost by sea level rise. Additionally these maps provided a visual for local elected officials to consider public policy implications with regard to secondary road and small bridge elevation issues, septic tank and well concerns, hardening of shorelines, relocation of residential structures, as well as taxing and revenue considerations.

With a grasp on the local issues and potential impacts of climate change and sea level rise, phase II of this project focused on an educational initiative to promote dialogue amongst local elected officials, county staff, and community groups. Through the utilization of Qwizdom software, MPPDC staff engaged stakeholders on the topic of climate change, sea level rise, and government's role in managing potential impacts.

III. Approach

Due to the sensitivity of this topic MPPDC staff consulted with county administrators in October 2009 to offer climate change education to county staff, planning commissions, and

local government bodies. However it was left to the county to decide how much information and support they would like to receive with regard to climate change, sea level rise, and government's role in responding or managing potential impacts.

Over the course of the year MPPDC staff presented an educational and interactive program to a variety of groups including Middle Peninsula Commissioners, local planners, Mathews County Rotary Club, and the Piankatank Civic League. MPPDC staff used Qwizdom software, an audience response system with handheld remotes and an interactive tablet to engage the audience on a topic of interest. Although this software has the capability of identifying participants and their answers, for the purposes of the PDC this function was not necessary; therefore, all answers provided by the Board members and group participants were completely anonymous. Within a PowerPoint presentation format, a series of yes/no, true/false, and multiple choice questions were split into three major categories: (1) Climate Change, (2) Sea Level Rise and (3) Governmental Services. Appendix A provides a list of questions that were asked to gain an understanding the audience's knowledge base and their perspective on the issues, as well as to trigger discussion.

In addition to the groups mentioned above, MPPDC staff was invited by the Mathews County Planning Department to present climate change and sea level rise information to the Mathews County Planning Commission.

IV. Findings

This section reviews feedback gathered during educational presentations to the local elected officials, county staff as well as the general public. *Please note that these results may not be statistically accurate and only provide a snapshot of thoughts and perceptions of climate change and sea level rise of a few groups within the Middle Peninsula.*

Local Elected Officials¹

On two separate occasions, MPPDC staff presented the climate change and sea level rise educational program to Middle Peninsula Planning District Commission Board members. As

¹ Please note that these results are only a representation of a portion of the Board members and should not be considered as the opinions of the entire Middle Peninsula Planning District Commission Board.

elected representatives from each county, this Board influences public policy change at the county and regional level. During phase I of this project, the MPPDC Board was introduced to the topic of climate change and sea level rise. Now in phase II of the project, MPPDC staff asked Board members to provide a response as well as to share what they know and how they feel about climate change, sea level rise and their role as local government in responding to potential impacts.

At the first meeting with the Board it was found 73% of the Board believes in Climate Change. While the majority of the Board believes that climate change impacts are occurring presently, 17% foresee their children, grandchildren, and great grandchildren dealing with climate change impacts. However there was a small portion of the Board that believes that climate change is **not** occurring *[NOTE: a specific percentage was not determined since some Board members inconsistently answered questions throughout the presentation]*. Moreover the majority of the Commission agrees that climate change will decrease the county's tax base. This may be attributed to the fact that sea level rise will reduce the size of waterfront parcels, or will completely flood the parcel, therefore impacting the property value and tax revenues collected.

With regards to sea level rise, 87% of the Board believes there have been changes in mean sea level rise within the Middle Peninsula over the last 10-20 years. Also the majority of the Board believes there has been an increase in storm events and flooding over the same period of time. Additionally 67% of the Commission believing sea level rise is gradual and slow, while 73% believe that they, along with their children, grandchildren, and great grandchildren, are impacted by sea level rise. This suggests that the Board believes that sea level rise impacts are occurring **now**, but the impacts of these changes will be extend over a long period of time.

Finally when considering government's role in potential impacts of climate change and sea level rise, 87% of the Board believes the cost of public services to high hazard areas (ie. areas that repetitively flood) will increase as climate change and sea level rise impacts compound. Though 40% of the Board believes that a property owner has the right to build a home on any existing lot in the Middle Peninsula if all permits can be obtained, but 70% of the Board **did not** believe it was local government is responsibility to cover the cost increase of providing public services to high hazard areas. Additionally 71% of the Board believes that local

government **does not** have a responsibility to provide public services to all existing lots, tracts or parcels; however the majority of Board members do believe that local government does have a role in managing the impacts of climate change and sea level rise. When specifically asked how local governments should cover the potential increased costs of public services to high hazard areas, 75% agree with the development of a high hazard district for special tax considerations, but other Board members entertained the options of levying an additional public service tax county-wide and setting aside general fund revenues to cover costs.

On a separate occasion at a monthly PDC meeting, which consists of MPPDC Board members as well as other county officials (ie. directors of economic development partnerships, directors of county planning commissions, county chairmen, etc), MPPDC staff was able to reassess the Board and county officials. Presented with the same questions from the first meeting about climate change, sea level rise, and government's role in managing the potential impacts, the outcomes from this second meeting were very much the same. It was found that the majority of participants at this meeting believed in climate change and sea level rise, and believed that local government has a role in managing the potential impacts. The majority of the group believed that a property owner has the right to build a home on any existing lot in the Middle Peninsula if all permits could be obtained, but also felt local government does not have the responsibility provide public service to any existing lot, tract or parcel. *For more findings please refer to Appendix D for the cumulative summary report.*

Overall the Commission seemed to consider climate change and sea level rise as a somewhat significant issue that local government has a role in managing. Although local governments may not necessarily know how they may assist in the management of potential climate change and sea level rise impacts, they do understand that things are changing and there will be a need for political actions in order to manage these changes and ultimately protect the safety, health, and welfare of constituents.

County Staff

With a more technical and land use planning background, county staff particularly county planners and commissions are influential in developing public policy within the county.

Therefore their perceptive and thoughts about climate change, sea level rise and government's role in managing the potential impacts are important to grasp.

During a local planners (ie. planners from Essex, King William, King & Queen, Mathews, Gloucester, and Middlesex Counties) meeting in February 2010, MPPDC staff presented the same questions that were asked to the MPPDC Board in order to uncover similarities and differences between the groups. It was found that 91% of the local planners believe in Climate Change, while 73% foresee their children, grandchildren, and great grandchildren dealing with climate change impacts. Moreover the majority of the planners agree that climate change will decrease the county's tax base.

Overall 100% of the Local Planners believe that there have been changes in mean sea level rise within the Middle Peninsula over the last 10-20 years, and the majority of Planners also believe there has been an increase in storm events and flooding over this same period of time. Sixty four percent of the Planners believe that sea level rise is gradual and slow, and 73% believe that sea level rise is impacting them, their children, grandchildren, and great grandchildren. These results suggest Planners believe that sea level rise impacts are occurring now, but the changes will be generational and will extend over a longer period of time.

Similar to the Board, 91% of the Planners believe the cost of public services to high hazard areas (ie. areas that repetitively flood) will increase as climate change and sea level rise impacts compound. Though 55% of the Planners believe that a property owner has the right to build a home on any existing lot in the Middle Peninsula if all permits can be obtained, 27% of the Planners **did not** feel that local government has the responsibility to provide public services to all existing lots, tracts or parcels; however the majority of Local Planners believe that local government does have a role in managing the impacts of climate change and sea level rise. When asked how local governments should cover the potential increased costs of public services to high hazard areas, 91% agreed with the development of a high hazard district for special tax considerations.

In addition to local planners, MPPDC staff was invited by Mathews County Planning Department to attend a February 2010 meeting of the Mathews County Planning Commission to discuss social perceptions of citizens and elected officials with regard to climate change, sea

level rise, global warming, repetitive storms, coastal flooding and subsidence. As the general discussion with the Planning Commission unfolded, those in attendance selected a storyline that accords best with their own personal worldview. Providing scientific data to support or disprove a parochial position on the issue carried little influence and was generally dismissed as not being geographically relevant to Mathews County: “data from the York River and not Mathews Specific, followed by... that’s New Point data, not East River data”.

MPPDC staff continued to refocus the discussion as to “What’s local government’s role in Climate Change?” as it relates to the protection of public health, safety, and welfare provisions extended to a locality by the Virginia General Assembly. The discussion concluded with an economic and environmental assessment conducted by MPPDC GIS staff that quantified the anthropogenic infrastructure in harm’s way and how the provision of public services will be impacted as well as the delivery of such services in the future. *For a full review of the presentation please refer to Appendix B.*

Overall there were members of the planning commission that believe that local government does not have any responsibility to protect public health, safety, or welfare of the citizens of Mathews and expect each citizen to be individually responsible for their welfare regardless of the climate change, sea level rise, global warming, repetitive storms, coastal flooding and subsidence impact. This belief system will mostly likely complicate future planning and the delivery of governments services in coastal localities.

General Public

MPPDC Staff also used Qwizdom to engage the general public, including the Rotary Club of Mathews County and the Piankatank Civic League, on the topic of climate change, sea level rise and government’s role in addressing the potential impacts.

The survey results revealed that 91% of the public believes in Climate Change. With the majority of the public also believing that climate change impacts are occurring presently, 59% foresee their children, grandchildren, and great grandchildren dealing with climate change impacts. Moreover when asked about the impacts to the tax base, 50% believe that the tax base will increase, while 26% believed there would be a decrease, and 18% believed that there

would be no impact to the county's tax base (the remaining participants did not answer the question).

Overall 83% of the public believe that there have been changes in mean sea level rise within the Middle Peninsula over the last 10-20 years, and the majority of the public also believe there has been an increase in storm events and flooding over this same period of time. With 41% of the public believing sea level rise is gradual and slow, 71% believe that sea level rise is impacting them, their children, grandchildren, and great grandchildren. This suggests that sea level rise impacts are occurring now, but the changes will extend over a long period of time.

Ninety-one percent of the public believe the cost of public services to high hazard areas (ie. areas that repetitively flood) will increase as climate change and sea level rise impacts compound. Though 48% of the participants believe that a property owner has the right to build a home on any existing lot in the Middle Peninsula if all permits can be obtained, 50% of the participants **did not** believe it was local government responsibility to provide public services to high hazard areas; however the majority of public did believe that local government has a role in managing the impacts of climate change and sea level rise. When asked how local governments should cover the potential increased costs of public services to high hazard areas, 71% agreed with the development of a high hazard district for special tax considerations, but other participants did entertain the options of levying an additional public service tax county-wide (9%) and setting aside general fund revenues (9%).

Additionally through the course of this year MPPDC staff collected a series of opinion articles posted in local news papers that demonstrate a broad range of thoughts and beliefs about climate change, global warming and sea level rise (Appendix C) within the region.

V. Discussion

Through this project it is clear that the local colloquial belief system is constructed through social interactions within local peer groups and depending on the particular peer group perspectives will differ. Additionally the role/job of each peer group, whether a decision maker (ie. local elected official), county staff, or a constituent, will also to influence perception and responses to climate change, sea level rise, and government's role in managing potential

impacts. Ultimately however all perceptions within the region will play a role in the development of future public policy to adapt.

However within the Middle Peninsula two counties have taken initiatives to address climate change and sea level rise. During the 2010 Mathews County Comprehensive Plan Update, the draft included a section that spoke of climate change. Specifically the plan mentioned, “possible sea level rise in conjunction with shoreline erosion and coastal subsidence (or sinking) is a concern for coastal Virginia. This is especially important for populated areas in terms of property damage and safety concerns as well as in terms of potential impacts on natural communities responding to changes in vegetative patterns, wildlife populations, and chemical responses due to temperature variation, runoff, varied rainfall, etc.” Appendix E provides a copy of the draft comprehensive plan that is planned to be adopted by the end of 2010. Also on August 3, 2010 Gloucester County Board of Supervisors motioned to amend the county’s floodplain management ordinance to increase of one foot of freeboard to the existing one foot to make a two foot freeboard clearance for new or substantially improved structures within the flood zones (Appendix F). According to the amended floodplain Management Ordinance, “These regulations are intended to ensure the health, safety and general welfare of the public by ensuring that inhabitants and property within a designated floodplain area are safe from damage due to flooding.”

VI. Next Steps

MPPDC staff will continue to work closely with local elected officials, county staff, sector representatives and the public to develop tools to appropriately manage potential climate change and sea level rise impacts. During phase III of this project, MPPDC staff will develop a START (Start Adaptation Response Today) kit that take takes a comprehensive approach in assembling, presenting, and customizing relevant information including (1) local scientific data, (2) Kaiser- Permanente Natural Hazard Vulnerability Assessment Tool results for the Middle Peninsula, (3) local, state, national and international case studies as well as (4) sample ordinances from communities (nationwide and internationally) that have adopted adaptation policies.

APPENDIX A:

The series of questions presented to audience about Climate Change, Sea Level Rise, and Governments role in responding to potential impacts

Climate Change

1. **Yes or No**...Do you believe in Climate Change?
2. **Yes or No**...Do you believe climate change impacts are occurring on the Middle Peninsula?
3. Do you believe climate change Impacts are ____?
 - a. Significant
 - b. Somewhat significant
 - c. Insignificant
 - d. Non-existent
4. If you believe in Climate Change, how will it impact your tax base?
 - a. Increase tax base
 - b. Decrease tax base
 - c. No impact
 - d. Do not believe in climate change
5. Climate Change impacts _____?
 - a. Me
 - b. My children and grandchildren
 - c. My great grandchildren
 - d. All of the Above
 - e. "Climate Change" is not occurring
6. **True or False**...Do local governments have a role in managing the impacts of climate change?

Sea Level Rise

7. **True or False**...Over the last 10-20 years, the mean se level has changed in Middle Peninsula rivers and Tributaries?
8. What is mean sea level? (pick the closest answer)
 - a. High tide
 - b. Low tide
 - c. Average tide
 - d. Don't know
9. How fast has sea level rise occurred on the Middle Peninsula?
 - a. Very fast
 - b. Somewhat fast
 - c. Gradual and Slow
 - d. Non-existent or no change
10. **Yes or No**...Do you believe there has been an increase in flooding and d storm events over ht last 10-20 years?

11. Sea Level rise impacts _____?
 - a. Me
 - b. My children and grandchildren
 - c. My great grandchildren
 - d. All of the Above
 - e. "Sea Level Rise" is not occurring
12. **Yes or No**...Do you believe local government has a role in managing the impacts of sea level change?

Government Services

13. **Yes or No**...Assuming all permits can be obtained should a property owner have the right to build a home on any existing lot in the Middle Peninsula?
14. **Yes or No**...Do local governments have a responsibility to provide public services to any existing lot, tract, or parcel?
15. **True or False**...The cost of public service to this hazard areas (areas the repetitively flood) will increase as climate change and sea level rise impacts compound.
16. If you believe the cost of public services will increase, how do you prefer locality pay for these costs to high hazarded areas?
 - a. Develop a high hazard district for special tax considerations
 - b. Levy an additional public service tax county-side
 - c. Set aside general fund revenues
 - d. Do not believe there will be an increase in costs

APPENDIX B:

Presentation to the Mathews County Planning Commission

Climate-Gate
Climate chaos? Don't believe it
Climate Skeptic- I don't Believe

-V-

Sea Level Rise
Climate Change
Global Warming
Repetitive storms
Coastal Erosion
Subsidence

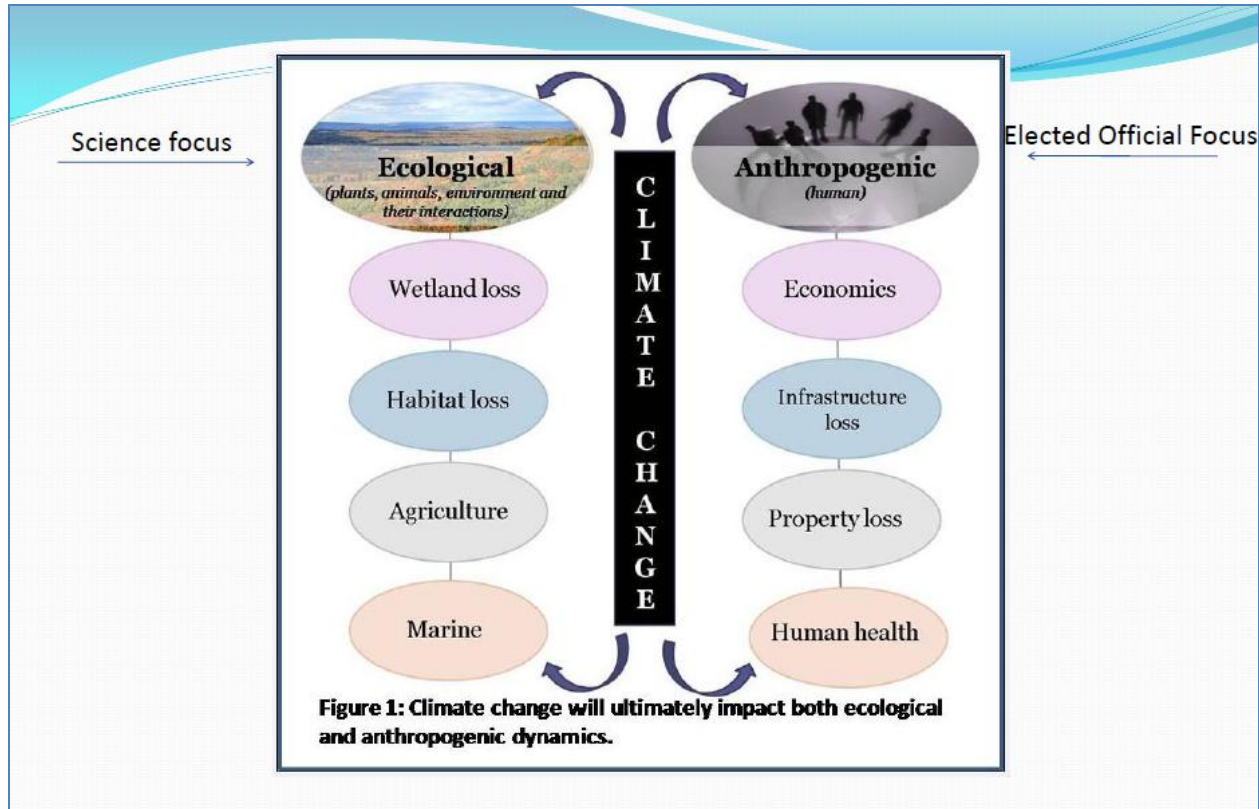
Why do people believe what they believe?

“People’s attitudes” towards Climate Change, Global Warming, Sea Level Rise...

- Belief systems constructed through social interactions within peer groups. (what do your neighbors believe?)
- People then select the storylines that accord best with their personal worldview. (this is what I believe?)

Possible Mathews County Beliefs?

1. However, some disagreed that global warming should be taken into consideration, saying the concept was "based on spurious data."
2. "should be aware of" the issue, but that it "shouldn't drive the development process."
3.pointed out that, even if the concept of sea level rise were left out of, "we still should be discouraging people from building there (in the lower part of the county). ...I dont agree with that statement!
4. "Waterfront in Mathews County is our economic base," he said. "Nothing else comes close... You have to be aware of possible sea level rise, but don't use a hammer to discourage someone from coming in and building a nice home."
5. However,said that residents in some areas of the county have complained about sand build-up and other problems and want to know why they were allowed to build there in the first place.



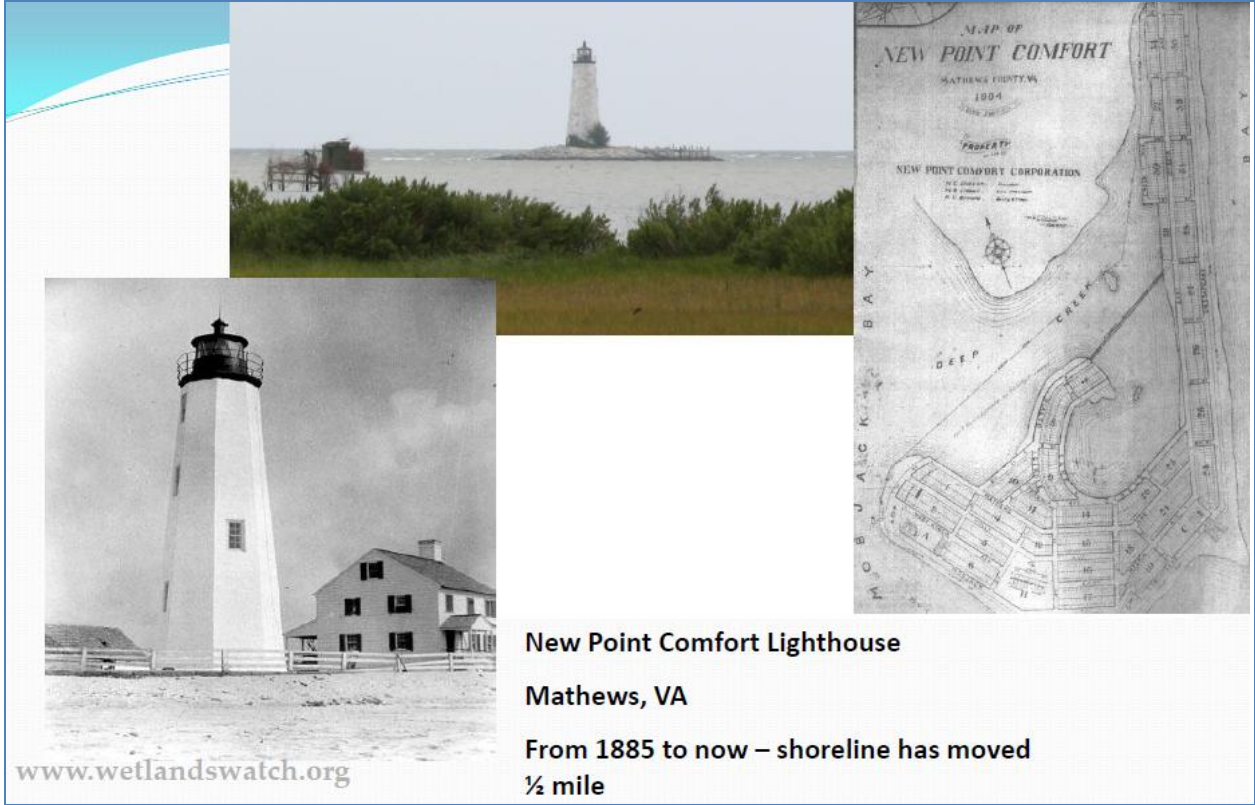
Question- What specifically should or could local government do?

What's local governments role in Climate change?

- Any county may adopt such measures as it deems expedient to secure and promote the **health, safety and general welfare** of its inhabitants which are **not inconsistent with the general laws of the Commonwealth.....**

What's Known

- Federal Flood Insurance Program – incentivizes development in hazard areas = more homes and businesses
- Loss of taxable real-estate (erosion, subsidence and/or sea level rise)
- More infrastructure in harms way (wells, septic, roads)
- Wildlife patterns changing- ask a waterfowler



New Point Comfort Lighthouse

Mathews, VA

**From 1885 to now – shoreline has moved
½ mile**

www.wetlandswatch.org



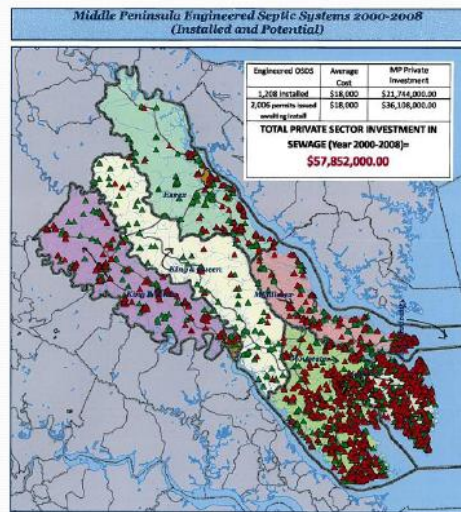
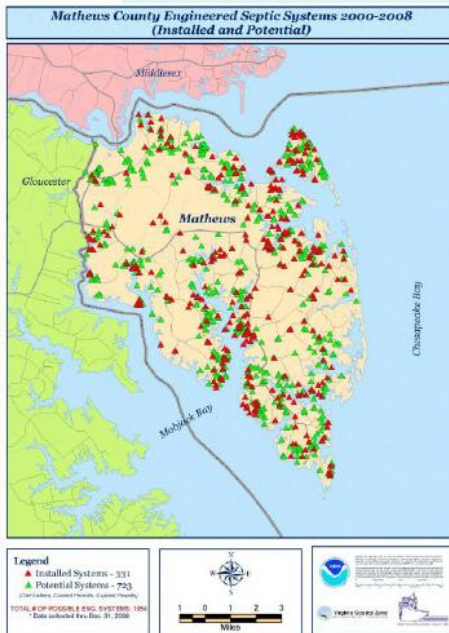
Mathews Coastline on the Move – Loss of Tax Base

www.wetlandswatch.org

Repetitively Flooded Infrastructure: Coastal lowland development – “by right”



Considerable Private Sector Infrastructure is in harms way





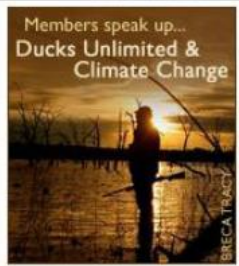
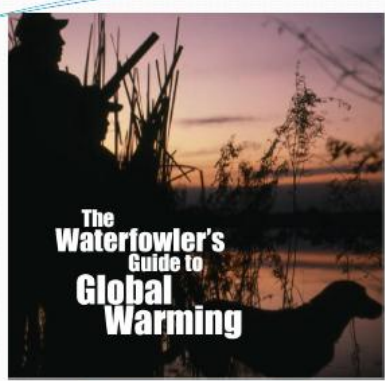
•Raise ½ mile of road 10 inches=
\$320,000
(no permits and environmental cost)

•**18%** of Gloucester Area VDOT
Secondary Road Budget

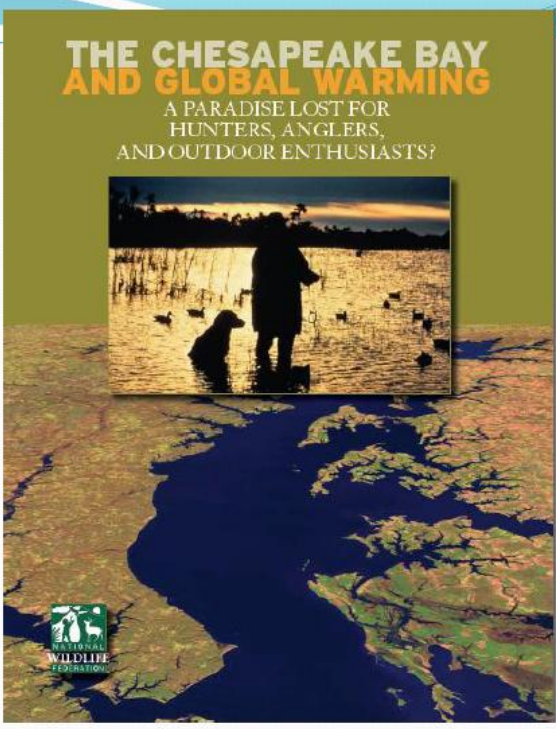
Putting it into perspective:
\$320,000 = ½ mile of road
\$640,000 = 1 mile of road
\$32,409,600 = 50.64 miles of road
(amount of road in snapshot to the right)



Global Warming Jeopardizes Cherished Outdoor Traditions in the Chesapeake Bay Region



The Major Investments in Chesapeake Bay Restoration Could Be Lost Due to Global Warming

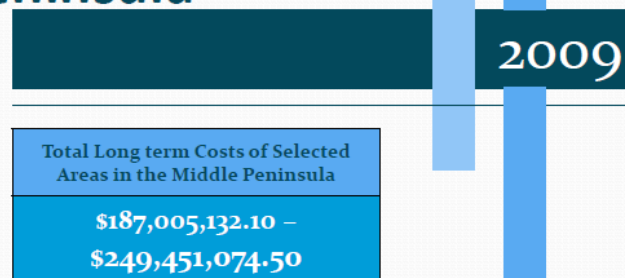


Public safety-Cost for Public Rescue and Public Services

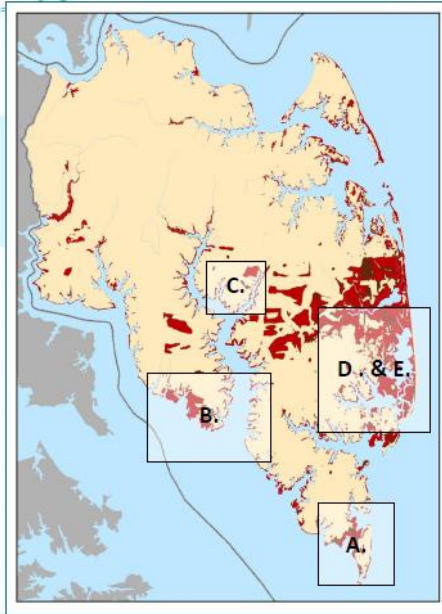


Assessing the economic and ecological impacts of sea level rise for select vulnerable locations within the Middle Peninsula

With well over 1,000 miles of linear shoreline, the Middle Peninsula is under direct threat from accelerated climate change. Specifically, sea level rise will impact coastal communities and infrastructure, as well as the region's natural resources.



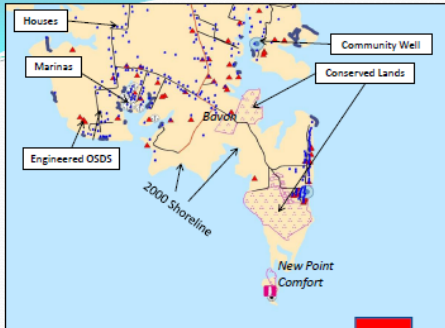
Mathews County



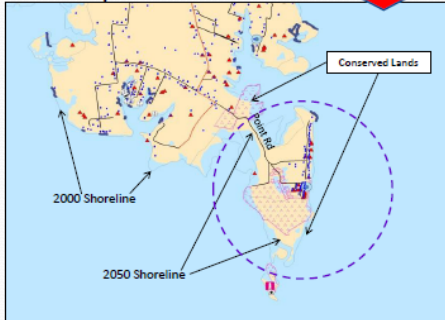
- A. New Point Comfort
- B. Bohannon
- C. Retz
- D. Onemo and Diggs
- E. Onemo and Diggs – Ecological impacts

★ Items to focus on.

2000 Current



2050 Impact

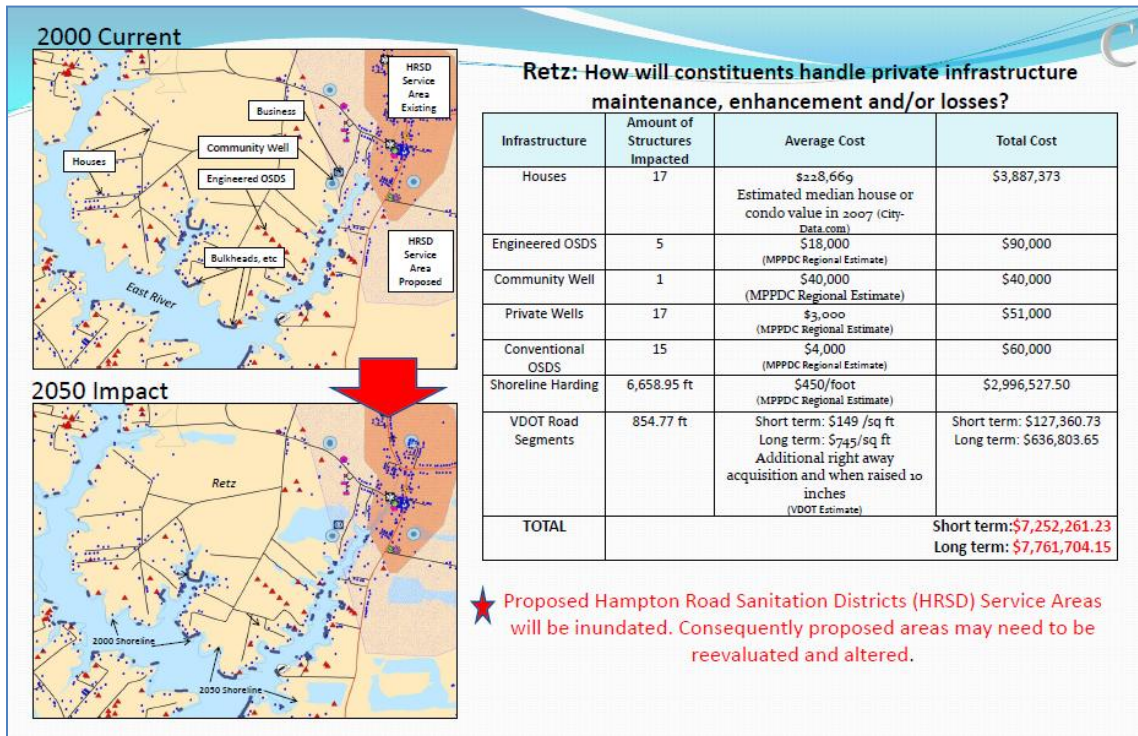
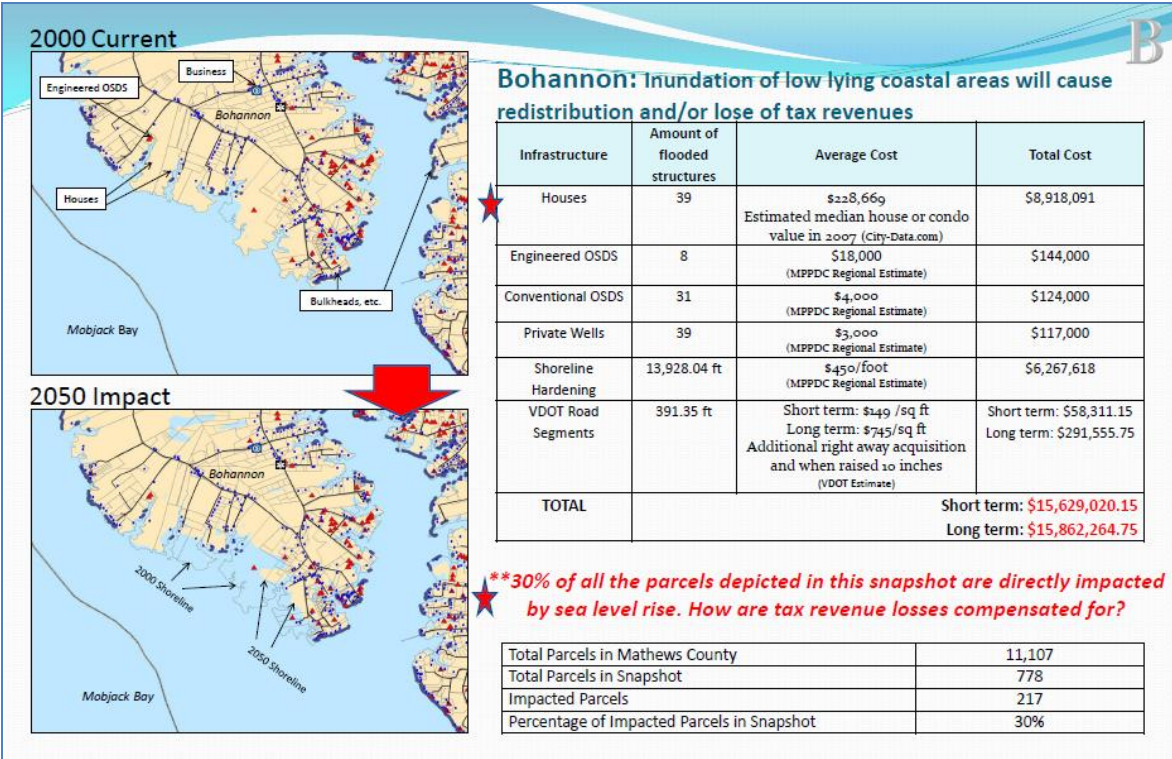


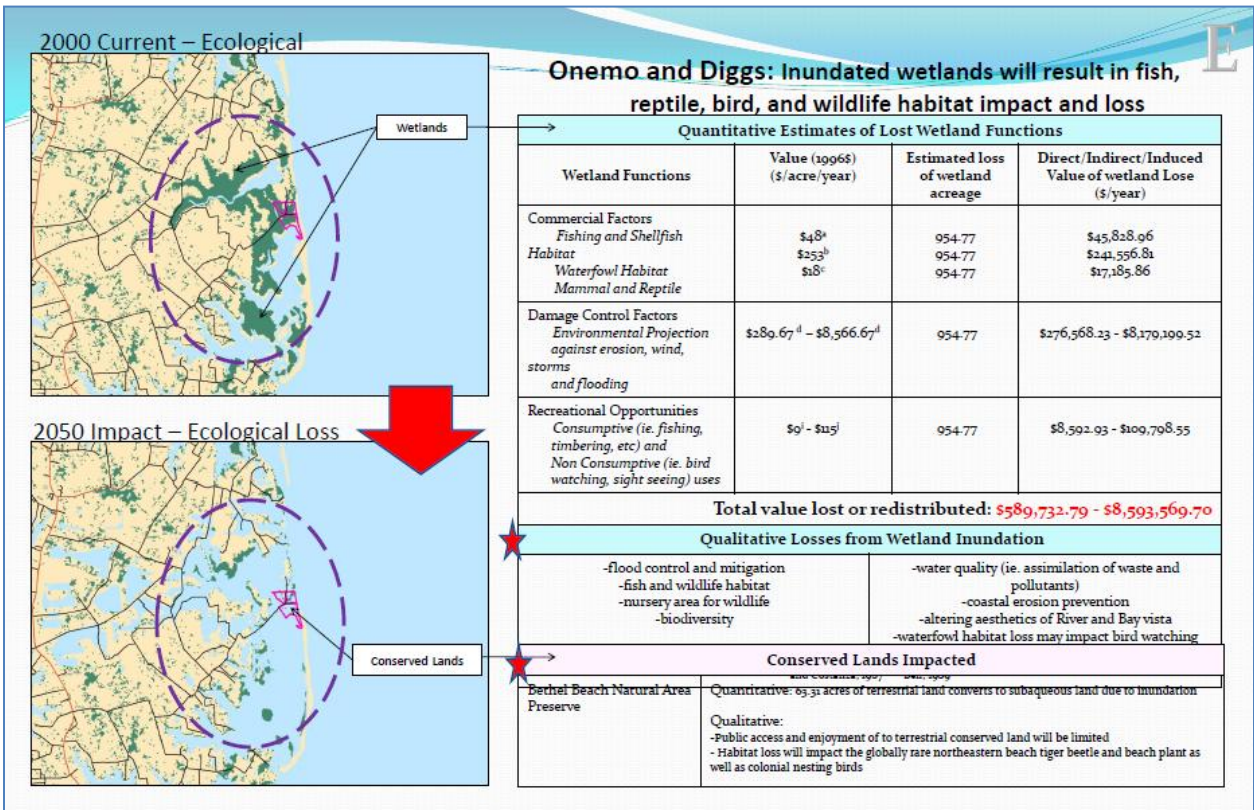
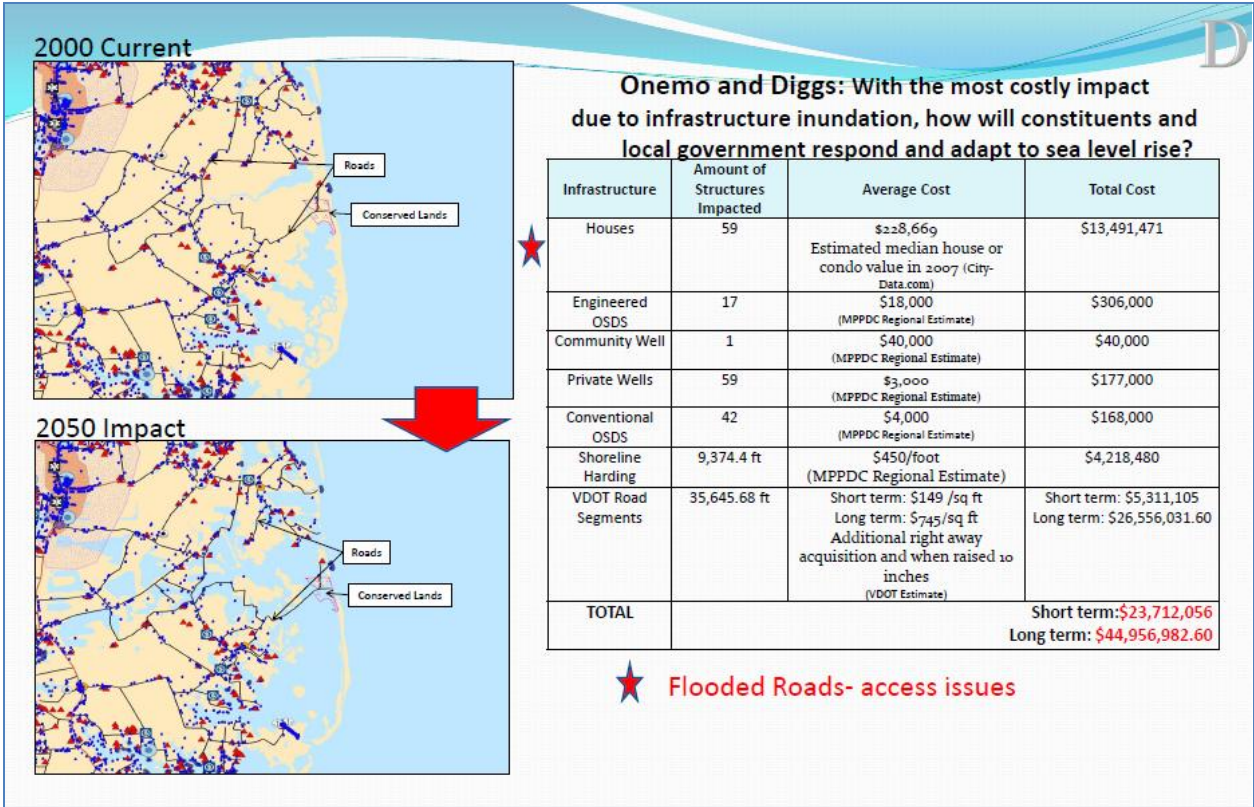
New Point Comfort: If Point Road floods consider the amount of infrastructure impacted

Infrastructure	Amount of Structures Impacted	Average Cost	Total Cost
★ Houses	72	\$228,669 Estimated median house or condo value in 2007 (City-Data.com)	\$16,464,168
★ Engineered OSDS	20	\$18,000 (MPPDC Regional Estimate)	\$360,000
★ Conventional OSDS	52	\$4,000 (MPPDC Regional Estimate)	\$208,000
Community Well (with 41 connections)	1	\$40,000 (MPPDC Regional Estimate)	\$40,000
Private Wells	31	\$3,000 (MPPDC Regional Estimate)	\$93,000
Shoreline Hardening	658.122 ft of riprap	\$60/foot (University of Minnesota)	\$39,487.37
★ VDOT Road Segments	1,250.67 ft	Short term: \$149 /sq ft Long term: \$745/sq ft Additional right away acquisition and when raised 10 inches (VDOT Estimate)	Short term: \$186,349.83 Long term: \$931,749.15
TOTAL			Short term: \$17,391,005.20 Long term: \$18,136,404.52

★ Public Policy Questions

- How will residents get to their house?
- How do residents get access to schools?
- How are OSDS and wells serviced?
- How are the roads serviced?
- How will conserved lands be accessed?
- How will EMS service this area?





Total Economic Impact of Selected Areas within the Middle Peninsula

Anthropogenic		Ecological
Short term	Long term	
\$126,230,366.20	\$185,765,366.80	\$4,239,764.75 - \$63,685,680.69

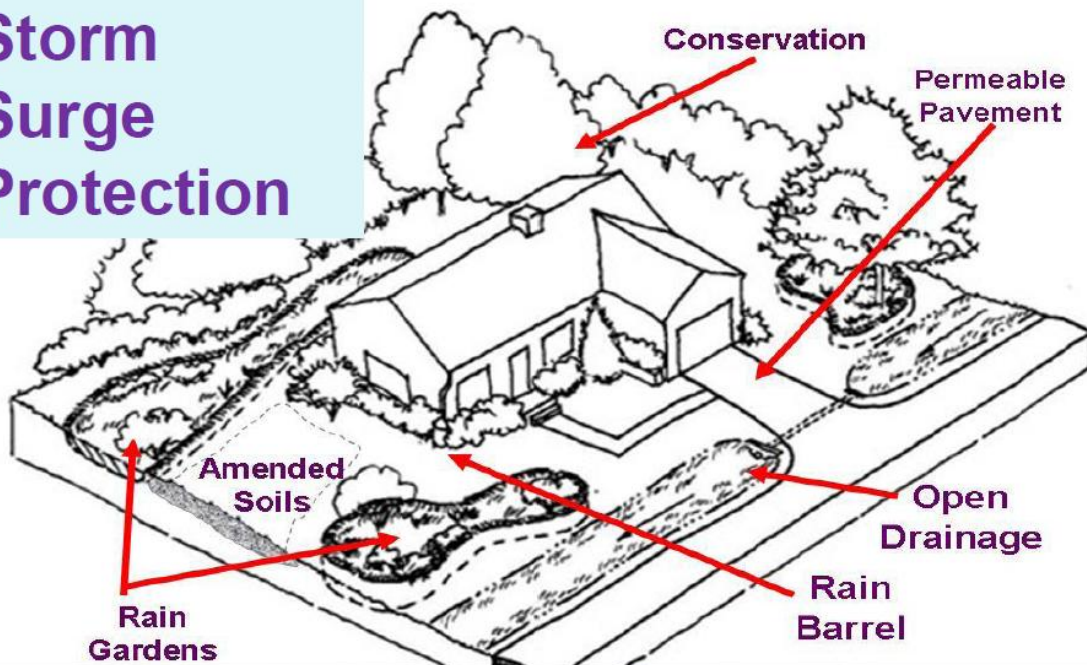
Total Short term Costs of Selected Areas in the Middle Peninsula	Total Long term Costs of Selected Areas in the Middle Peninsula
\$157,470,131.60 - \$211,916,046.90	\$187,005,132.10 - \$249,451,074.50

Planning Responses to Sea Level Rise, Climate Change et al

- Set-back Ordinances
- Flood Plain Zoning
- Building Codes
- Public Abandonment
- Living shore lines
- Special High Hazard Taxing Districts



Storm Surge Protection



Create a Hydrologically Functional Lot



Planning Commission question for future policy consideration

Yes or No....

Assuming all permits can be obtained,
should a property owner have the right
to build a home on any existing lot in
the Mathews?

Yes or No....

Does local government have a responsibility to provide public services to any existing lot, tract, or parcel?

True or False

The cost of public services to high hazard areas (areas that repetitively flood) will increase as climate change and sea level rise impacts compound.

Multiple Choice

If you believe the cost of public services will increase, how do you prefer localities pay for these costs to high hazard areas?

- A. Develop a high hazard district for special tax considerations
- B. Levy an additional public service tax county-wide
- C. Set aside general fund revenues
- D. Do not believe there will be an increase in costs

Questions

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Virginia Coastal Zone
MANAGEMENT PROGRAM



This project was funded by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant FY2008 NA08NOS4190466 Task 12.04 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended. The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Department of Commerce, NOAA, or any of its sub-agencies.

Appendix C:

Public Opinions of Climate Change and Sea Level Rise amongst Constituents in the Region

The harsh reality of global climate change

To the Editor:

The writer of last week's letter questioning the reality of anthropogenic global climate change and its implications was long on anecdotal observations and seriously wanting in the facts that several decades of intense scientific research have firmly established. For example, variations of solar activity, a concept much beloved by the climate denial camp, have convincingly been shown to produce only minor alterations to global temperatures.

Every year our utilization of fossil fuels and agricultural and land clearing activities pump 10 billion tons of carbon into the thin carapace of our global atmosphere. As a result, the CO₂ (carbon dioxide) content of the atmosphere will reach 400 ppm (parts per million) in the near future, significantly higher than the maximum value of atmospheric CO₂ (300 ppm) for the last 800,000 years, as indicated from study of deep ice cores recovered from the Antarctic ice sheet.

The paleoclimate database clearly indicates that past warming events were closely associated with periods of elevated CO₂ content in the earth's atmosphere. The current high CO₂ levels (388 ppm) have already made themselves felt, not only in a clear warming trend, but also in the unprecedented array of recent extreme weather events spanning the globe, a situation predicted by the great majority of climate modelers.

Finally, the statement that we would be required "to hand off our economy to the UN and cripple growth and jobs" strikes me as little more than paranoia.

Sam Sawkins
Urbanna

Southside Sentinel
March 11, 2010

No surprise

It certainly comes as no surprise that the liberal Democrats in Congress would reject the recent exposure of e-mails sent by climatologists that suggest they are covering up the real numbers on global warming. My only response to their reaction would be to quote James Madison from "The Federalist Papers," Letter 10, when he said, "Enlightened statesmen will not always be at the helm."

It is insane that they have no qualms about committing our country to spending \$147 trillion on the environment over the next several years, but they are concerned about the effect the troop surge in Afghanistan will have on the deficit. We need to send a very strong message to Congress over the next two election cycles. Every incumbent must be thrown out. Let's start over with a totally new Congress by 2012.

Larry Fritz
Poquoson

Daily Press
December 11, 2009

Other forces

The Nov. 30 article "Climate change is personal in La." is yet another example of an incomplete and misleading headline to focus attention on global warming.

There is little doubt that much coastal land is being lost to the sea, particularly in the southeast United States, creating the changes noted in the article. However, one very important fact that is buried in one short paragraph is that "ground-level subsidence" is also a contributing factor. By doing a little online research, one can find articles that indicate that along the Louisiana coast ground-level subsidence may be two to three times more significant than the predicted sea-level rise due to global warming.

Even if there were no global warming, substantial portions of the Louisiana coast will be underwater from other causes, including erosion and ground-level subsidence, which were only briefly referenced in the article.

We should not allow attention-grabbing headlines to mislead us into believing that *if* the effects of global warming are mitigated by natural changes or reducing man's potential contribution to global warming, coastal areas will remain high and dry. Other forces are in play and perhaps should get more attention than global warming.

Ed Merz
Hayes

Daily Press
December 11, 2009

Global Warming theory an affront to God

Editor, Gazette-Journal:

The Global Warming theory is an affront to my God.

The term Global Warming had been changed to Climate Change since world temperatures have been going down, not up. But, by whatever name, the theory is that the fate of the world depends on us humans and we must scale back our standard of living somewhere near the Stone Age or else the world will not be habitable.

But, we humans are not capable of destroying—or saving—the planet. The climate is controlled by God and the earth will be destroyed by God on His time schedule regardless of anything we do or don't do.

Of course we should be responsible stew-

ards. As individuals, and at local levels, we should strive to keep our world as pollutant free as possible and certainly there is no virtue in being wasteful.

But do we have to scrimp and save and go lacking? God has not shortchanged us. He didn't quit on the seventh day because He was tired and had an attitude—That's all you get—You'll just have to make do. He rested—or more accurately, He finished—because He had provided for all of man's needs in profusion, as He wants us to enjoy abundance.

Sue Long
North, Va.

SEE READERS WRITE, PAGE 7A

Gazette Journal
January 7, 2010

Warming is good

Re: The Dec. 14 Associated Press article by Seth Borenstein et al., "Science not faked, but not pretty either." I feel better already, knowing that five AP reporters, with extensive scientific credentials I'm sure, carefully perused and restudied the million words contained in the 1,073 leaked climate-change e-mails. And that the five AP meteorologists were under no pressure from their publishers and editors to reach the conclusion that they did.

Just for a nod toward Balancing the AP Five, one might well check on the Global Warming Petition Project (easily found on the Internet), wherein 31,486 real scientists, more than 900 with Ph.D.s, have signed on to the thesis that "there is no convincing scientific evidence that human release of carbon dioxide, methane or other greenhouse gases is causing or will in the foreseeable future cause catastrophic heating of the Earth's atmosphere and disruption of the Earth's climate." In fact, they say there is substantial scientific evidence that increases in atmospheric CO2 will produce many beneficial effects on plants and animals.

Charles Flynn
Poquoson

Daily Press
January 7, 2010

Another view of global warming

Editor, Gazette-Journal:

In the left's obsessive view of the persistent threat of Global Warming, Barack Obama announced, "The science is beyond dispute and the facts are clear, sea levels are rising, coastlines are shrinking, we've seen record droughts, spreading famine and storms that are growing stronger with each passing hurricane season." Few of these statements have any factual basis.

Contrary to the advocates of Global Warming, global temperatures haven't risen at all in the last 13 years; for 10 years they remained level and in the last three they have been dropping. We are currently in a period of global cooling.

Not since Leni Reifenstahl's "Triumph of the Will," has there been a more successful exercise in pure propaganda than Al Gore's "An Inconvenient Truth." Like Aldous Huxley's observation, "Facts do not cease to exist because they are ignored."

Andrew Maggard
Port Haywood, Va.

Gazette Journal
December 10, 2009

Appendix D:

Understanding Perceptions of Climate Change and Sea Level Rise Impacts within the Middle Peninsula: **CUMULATIVE RESULTS**

Through recent months Middle Peninsula Planning District Commission staff has utilized Qwizdom software to engage a variety of audiences on the topic of climate change, sea level rise, and local government's role in managing potential impacts. Each audience surveyed was presented with the same set of questions in order to compare and contrast responses. The stakeholder groups sampled, included PDC Commissioners, local planning staff, as well as the public (ie. Mathews County Rotary Club and Piankatank Civic League), whom will all have a role in influencing the future development of public policy to respond to climate change and sea level rise.

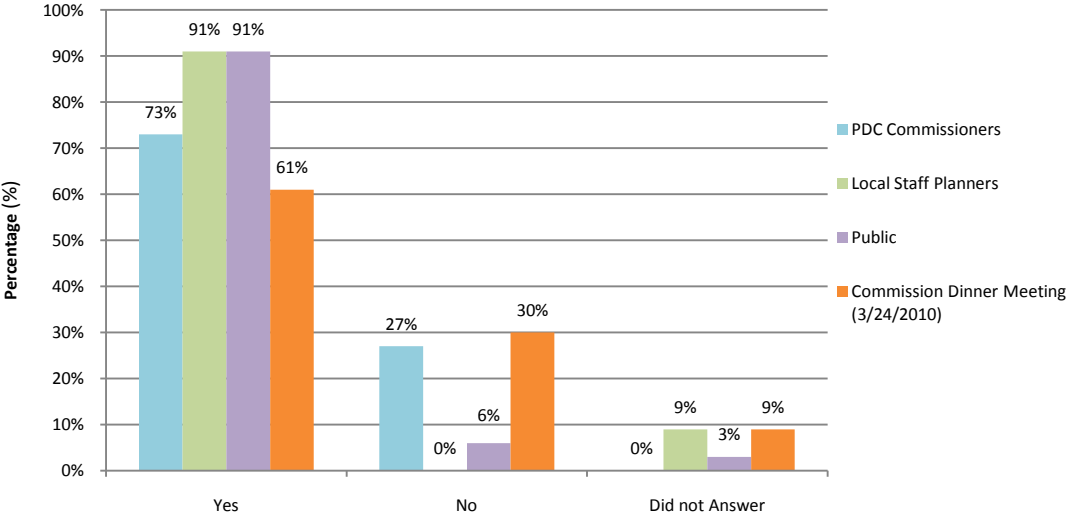
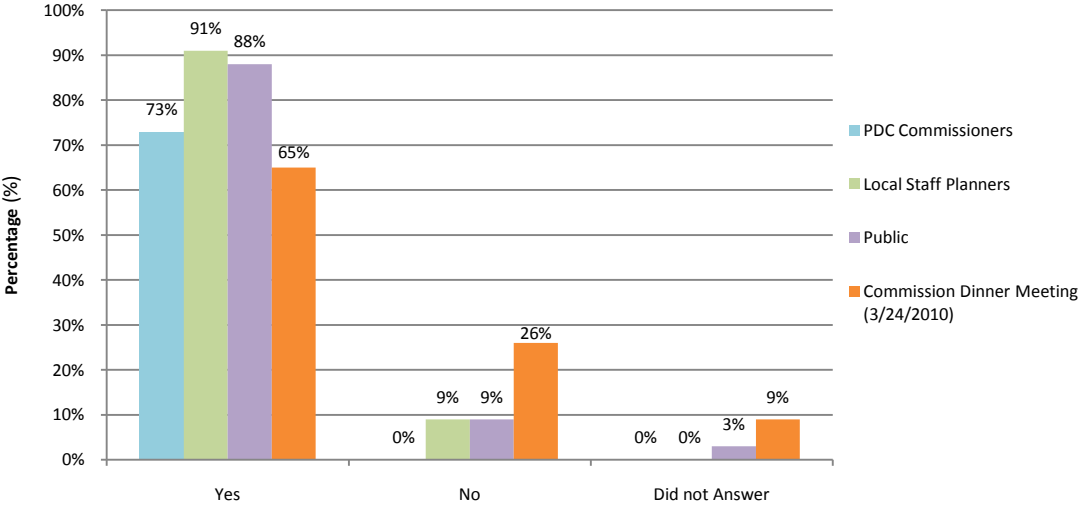
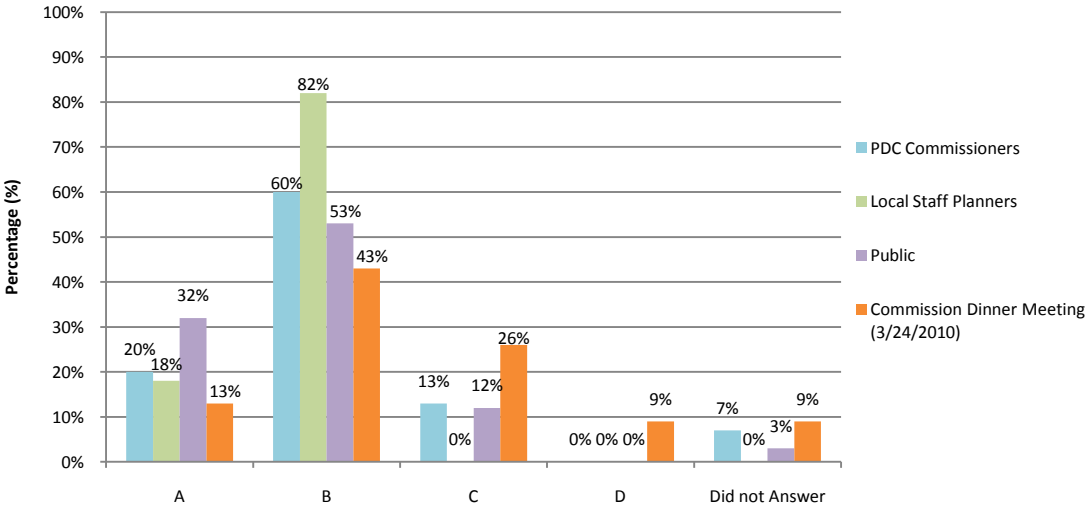


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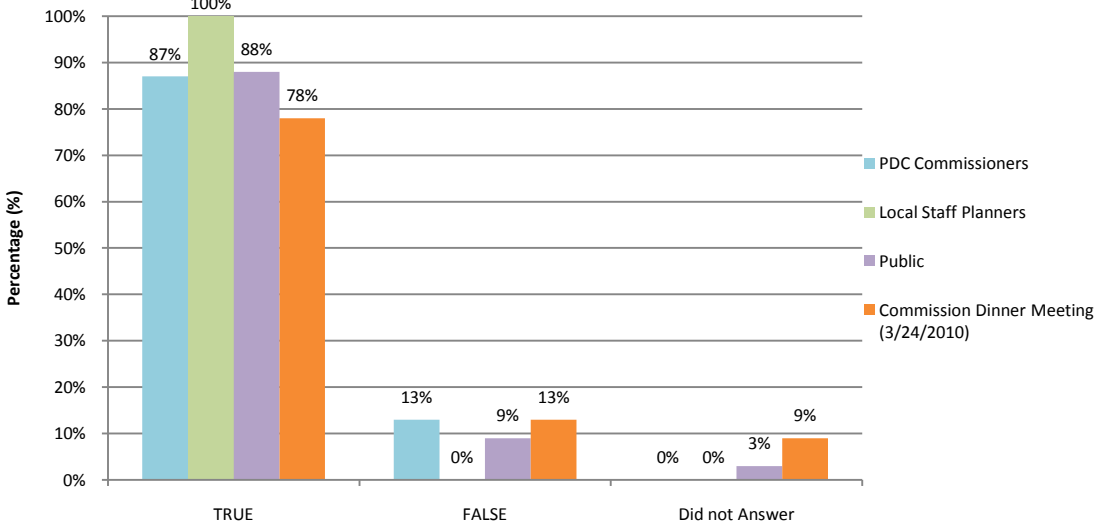
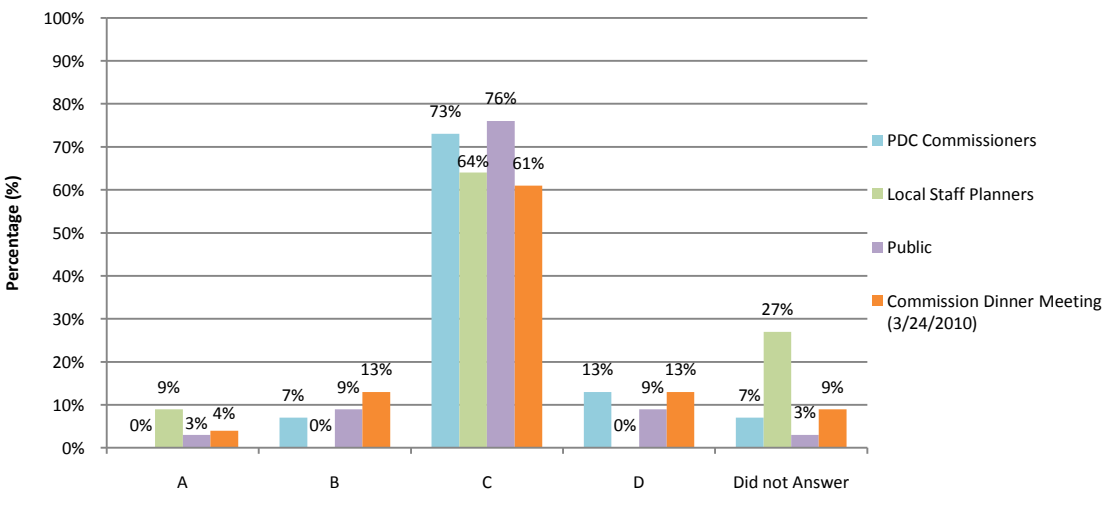
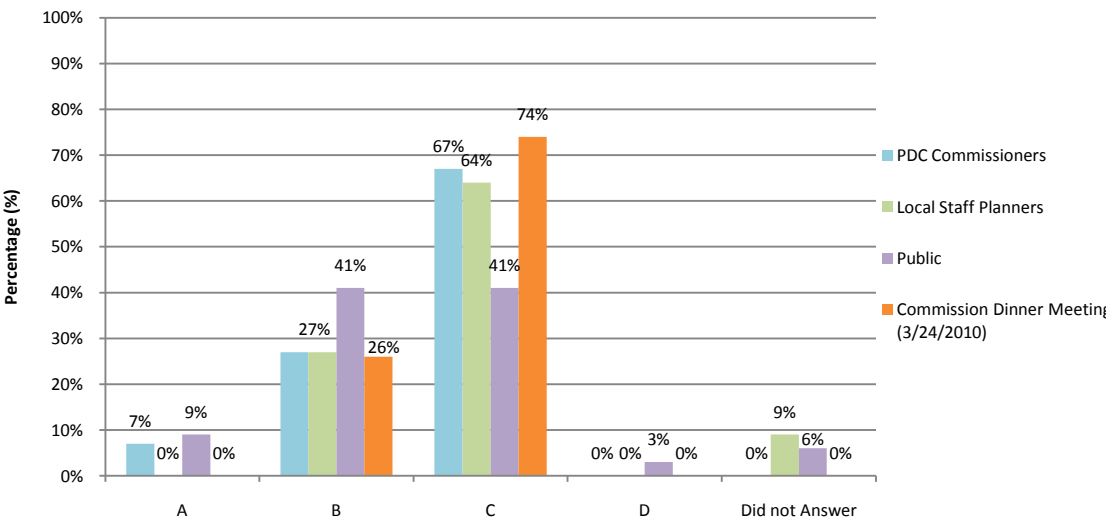
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*Geographic redundancy between question 1 and question 2

April 19, 2010

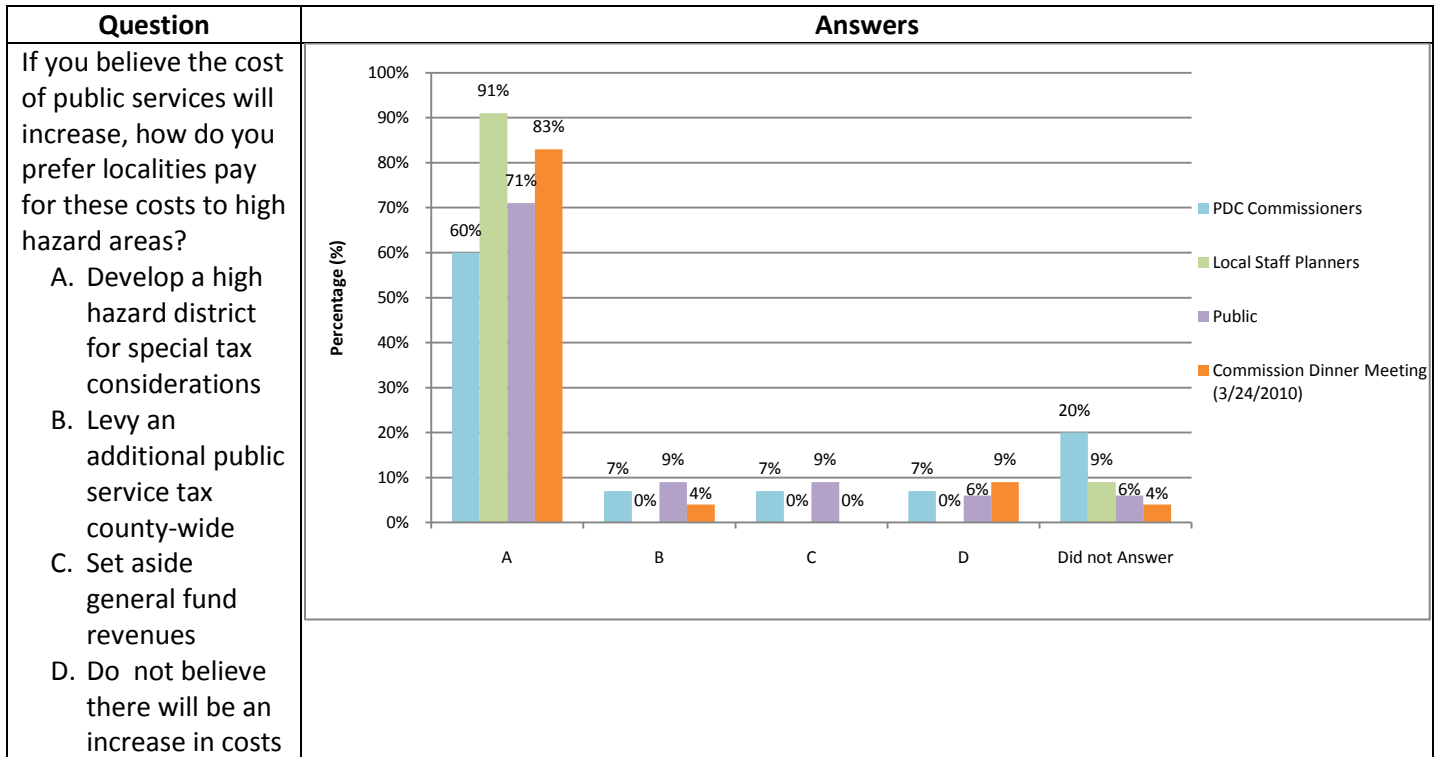
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<p>Do you believe there has been an increase in flooding and storm events over the last 10-20 years? (Yes or No)</p>	<table border="1"> <caption>Data for Question 1: Increase in flooding and storm events</caption> <thead> <tr> <th>Response</th> <th>PDC Commissioners</th> <th>Local Staff Planners</th> <th>Public</th> <th>Commission Dinner Meeting (3/24/2010)</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>67%</td> <td>100%</td> <td>79%</td> <td>83%</td> </tr> <tr> <td>No</td> <td>27%</td> <td>0%</td> <td>18%</td> <td>4%</td> </tr> <tr> <td>Did not Answer</td> <td>7%</td> <td>0%</td> <td>3%</td> <td>13%</td> </tr> </tbody> </table>	Response	PDC Commissioners	Local Staff Planners	Public	Commission Dinner Meeting (3/24/2010)	Yes	67%	100%	79%	83%	No	27%	0%	18%	4%	Did not Answer	7%	0%	3%	13%															
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<p>Sea level rise impacts.....</p> <ul style="list-style-type: none"> A. Me B. My children and grandchildren C. My great grandchildren D. All of the Above E. "Sea level rise" is not occurring 	<table border="1"> <caption>Data for Question 2: Sea level rise impacts</caption> <thead> <tr> <th>Response</th> <th>PDC Commissioners</th> <th>Local Staff Planners</th> <th>Public</th> <th>Commission Dinner Meeting (3/24/2010)</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>7%</td> <td>0%</td> <td>3%</td> <td>4%</td> </tr> <tr> <td>B</td> <td>13%</td> <td>0%</td> <td>6%</td> <td>9%</td> </tr> <tr> <td>C</td> <td>7%</td> <td>9%</td> <td>4%</td> <td>4%</td> </tr> <tr> <td>D</td> <td>73%</td> <td>71%</td> <td>70%</td> <td>70%</td> </tr> <tr> <td>E</td> <td>0%</td> <td>9%</td> <td>3%</td> <td>9%</td> </tr> <tr> <td>Did not Answer</td> <td>0%</td> <td>9%</td> <td>4%</td> <td>4%</td> </tr> </tbody> </table>	Response	PDC Commissioners	Local Staff Planners	Public	Commission Dinner Meeting (3/24/2010)	A	7%	0%	3%	4%	B	13%	0%	6%	9%	C	7%	9%	4%	4%	D	73%	71%	70%	70%	E	0%	9%	3%	9%	Did not Answer	0%	9%	4%	4%
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D	73%	71%	70%	70%																																
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<p>Do you believe local government has a role in managing the impacts of sea level change? (Yes or No)</p>	<table border="1"> <caption>Data for Question 3: Local government role in managing impacts</caption> <thead> <tr> <th>Response</th> <th>PDC Commissioners</th> <th>Local Staff Planners</th> <th>Public</th> <th>Commission Dinner Meeting (3/24/2010)</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>87%</td> <td>91%</td> <td>82%</td> <td>52%</td> </tr> <tr> <td>No</td> <td>13%</td> <td>9%</td> <td>15%</td> <td>44%</td> </tr> <tr> <td>Did not Answer</td> <td>0%</td> <td>0%</td> <td>3%</td> <td>4%</td> </tr> </tbody> </table>	Response	PDC Commissioners	Local Staff Planners	Public	Commission Dinner Meeting (3/24/2010)	Yes	87%	91%	82%	52%	No	13%	9%	15%	44%	Did not Answer	0%	0%	3%	4%															
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Question	Answers																				
<p>Assuming all permits can be obtained, should a property owner have the right to build a home on any existing lot in the Middle Peninsula? (Yes or No)</p>	<table border="1"> <caption>Survey Results: Right to Build Home</caption> <thead> <tr> <th>Response</th> <th>PDC Commissioners</th> <th>Local Staff Planners</th> <th>Public</th> <th>Commission Dinner Meeting (3/24/2010)</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>40%</td> <td>55%</td> <td>50%</td> <td>48%</td> </tr> <tr> <td>No</td> <td>60%</td> <td>45%</td> <td>47%</td> <td>52%</td> </tr> <tr> <td>Did not Answer</td> <td>0%</td> <td>0%</td> <td>3%</td> <td>0%</td> </tr> </tbody> </table>	Response	PDC Commissioners	Local Staff Planners	Public	Commission Dinner Meeting (3/24/2010)	Yes	40%	55%	50%	48%	No	60%	45%	47%	52%	Did not Answer	0%	0%	3%	0%
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<p>Does local government have a responsibility to provide public services to any existing lot, tract, or parcel? (Yes or No)</p>	<table border="1"> <caption>Survey Results: Local Government Responsibility</caption> <thead> <tr> <th>Response</th> <th>PDC Commissioners</th> <th>Local Staff Planners</th> <th>Public</th> <th>Commission Dinner Meeting (3/24/2010)</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>13%</td> <td>64%</td> <td>50%</td> <td>26%</td> </tr> <tr> <td>No</td> <td>80%</td> <td>27%</td> <td>44%</td> <td>74%</td> </tr> <tr> <td>Did not Answer</td> <td>7%</td> <td>9%</td> <td>6%</td> <td>0%</td> </tr> </tbody> </table>	Response	PDC Commissioners	Local Staff Planners	Public	Commission Dinner Meeting (3/24/2010)	Yes	13%	64%	50%	26%	No	80%	27%	44%	74%	Did not Answer	7%	9%	6%	0%
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<p>The cost of public services to high hazard areas (areas that repetitively flood) will increase as climate change and sea level rise impacts compound. (True or False)</p>	<table border="1"> <caption>Survey Results: Cost of Public Services</caption> <thead> <tr> <th>Response</th> <th>PDC Commissioners</th> <th>Local Staff Planners</th> <th>Public</th> <th>Commission Dinner Meeting (3/24/2010)</th> </tr> </thead> <tbody> <tr> <td>TRUE</td> <td>87%</td> <td>91%</td> <td>94%</td> <td>91%</td> </tr> <tr> <td>FALSE</td> <td>7%</td> <td>9%</td> <td>6%</td> <td>9%</td> </tr> <tr> <td>Did not Answer</td> <td>7%</td> <td>0%</td> <td>0%</td> <td>0%</td> </tr> </tbody> </table>	Response	PDC Commissioners	Local Staff Planners	Public	Commission Dinner Meeting (3/24/2010)	TRUE	87%	91%	94%	91%	FALSE	7%	9%	6%	9%	Did not Answer	7%	0%	0%	0%
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Appendix E: Mathews County Comprehensive Plan Update – Sections Mentioning Climate Change



Mathews County Comprehensive Plan 2030

V. Mathews County Today and Tomorrow: Conditions, Opportunities, Policies and Strategies

Transportation

With the exception of a few intersections where improvements may be warranted because of the traffic movements (e.g., Route 14 and 198 and Route 3 and 198), the transportation corridors in Mathews serve the County well. Maintenance of stormwater ditches should be improved; however, this will require a collaborative effort between VDOT, the County and private property owners in order to effectively improve stormwater management along County roads.

There should be a discussion with VDOT to identify the feasibility of an alternative route to bypass Route 14 to the east of the Courthouse area. In an emergency event, such as a hurricane, if Route 14 (Main Street) is blocked due to flooding, there is not a primary access route to evacuate residents in the southern and eastern portions of the County. A potential alternative route could be a north/south road east of the Courthouse area connecting Tabernacle Road to Buckley Hall Road. In addition, since there is only one bridge to Gwynn's Island, alternative means for evacuating residents of the Island in the event of a hurricane should be identified.

When the 2035 Regional Transportation Plan is completed, it should be adopted as an amendment to this Comprehensive Plan.

Recreation

Recreation opportunities are very promising for Mathews County in the future. Increased public access to shorelines and waterfront facilities can provide citizens and visitors with wonderful experiences and resources that have been so highly valued by residents for generations. The 2003 *Statewaters Access Plan for Mathews County* provides an extensive inventory of public facilities and makes recommendations for potential improvements. This plan should be updated with respect to recommendations for improvements and priority facilities. The East River Boat Yard property in West Mathews offers great potential for additional public access.

In addition, there are increased opportunities for use of existing bicycle routes and blueways, which can promote the County as a seasonal destination. In general, these compatible recreation activities are sensitive to the environment and beneficial to the local economy.

At present, the County does not have an adopted Parks and Recreation Master Plan. This type of planning document would be very beneficial in assessing the existing facilities and programs in the County. The document could be developed in coordination with the YMCA and other recreational programming agencies and could provide a more detailed and directed plan for public needs and future recreational opportunities within the County.

Emergency Services

Public emergency systems and public response for hazards are important future issues that will need to be carefully monitored on an annual basis. While the existing volunteer emergency/fire



*V. Mathews County Today and Tomorrow:
Conditions, Opportunities, Policies and Strategies*

system is working well in Mathews, there should be an annual review of emergency events, response times/coverage, facilities, and equipment, etc. to ensure that the public’s health, welfare, and safety are met. At present, the County is supplementing volunteer services at primary facilities during peak weekdays and weekends; additional funding and staffing may be required in the future.

Storm surges and flooding from coastal storms will continue to be a challenge, especially in those areas of the County that have higher potential for flooding and only have one primary access road. With possible climate changes and rising sea levels, coastal living and public safety issues will require careful attention to land use management and public education.

Education

Continuing education and workforce training will be most beneficial for residents and businesses. With the aging population, declining numbers of school children, and the increasing trend for youth to move to more populated, employable areas, it will be especially important to promote technical training and continued education for residents. Educational opportunities should be for both technical and cultural purposes and can be made available by both public and private entities. These opportunities can be enhanced with and expanded broadband communication system and increased collaboration among educational providers.

Human Services

County officials have recognized the growing citizen interest in suitable residential options for seniors in order to allow residents to age and remain within their home county. At present, there is only one senior care facility in the County, thereby limiting options for those who may want or need alternative housing or assisted care.

Planning/Development Policies, Action Strategies for Public Facilities & Services 2030

Planning / Development Policies and Strategies for Public Facilities & Services	
PFS 1	A safe water supply for Mathews County is critical for public safety and community well-being. Existing and new development in the County should protect water quality and quantity.
	1. In considering expansion of existing development or new development, there should be an assessment of water demand for the proposed use and potential effects on water quality and quantity. Suitable provisions should be employed for water conservation and for adequate treatment of sewage, including regular monitoring and maintenance of systems.



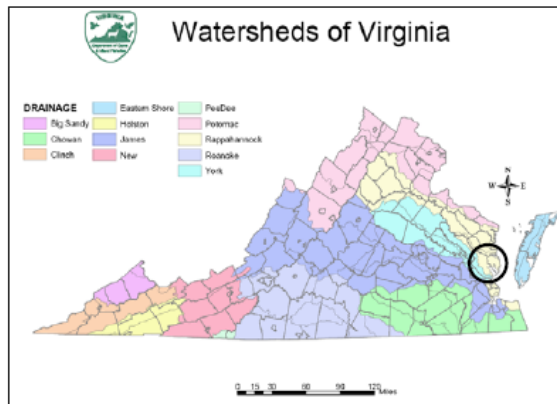
V. Mathews County Today and Tomorrow: Conditions, Opportunities, Policies and Strategies

During 2009, there has been increased leadership from the Governor of Virginia (as well as from other states) and the President of the United States in addressing pollution issues in the Chesapeake Bay. The Chesapeake Executive Council, comprised of various state and federal representatives, set more aggressive short-term milestones to reduce nitrogen and phosphorus by 2011 – Virginia’s goal is to reduce phosphorus and nitrogen loads over the next three years through loan and grant funds for improvements to wastewater systems, land conservation, and BMPs for agriculture, septic systems, stormwater management and erosion and sediment control. At the federal level, an Executive Order for Chesapeake Bay Protection and Restoration (signed May 12, 2009) established a Federal Leadership Committee to oversee coordination of programs and activities involved with Bay restoration; to strengthen accountability of federal agencies; to collaborate with the various state governments; and to publish an annual Chesapeake Bay Action Plan (with recommended funding) and Progress Report for Bay restoration. Within the next six months, reports are expected from lead agencies which will discuss key challenges for the Chesapeake Bay including recommendations for new regulatory tools, programs and policies; expanding public access to waters and open spaces; focusing habitat and research activities; and assessing the impacts of climate change.

The following sections provide more detailed background information and recommendations for the purposes of updating information and meeting the Comprehensive Plan requirements for the Chesapeake Bay Act.

Watersheds and Existing Water Quality

A general map showing the watersheds of Virginia is shown to the right. Mathews County lies between two major watersheds in the State of Virginia – the Rappahannock River and the York River. According to the 2008 water quality report, Chesapeake Ecocheck, the Rappahannock River is rated a moderate to poor ecosystem health, while the York River was considered in poor ecosystem health. The County is divided into six smaller watersheds which are considered part of the lower Chesapeake Bay



Source: Virginia Department of Game and Inland Fisheries. www.dgif.virginia.gov/education/virginia_watersheds.

watershed: Piankatank River–Carvers Creek, Piankatank River-Hills Bay, Lower Chesapeake Bay-Milford Haven, Lower Chesapeake Bay-Winter Harbor, East River, and North River. These watersheds are illustrated on the map on the following page.



Access to the Waterfront

Mathews County is extremely fortunate to have 280 miles of shoreline. This tremendous asset is highly valued by residents and County officials because of its contribution to the area's quality of life, recreation, and local economy. In 2003, the County adopted a *Staterwaters Access Management Plan* that provided information on all public access areas and marinas throughout the County. The plan also includes specific recommendations and priorities for improving public facilities. More detailed information on this waters access plan is found in the preceding section, Public Facilities and Services (Recreation).

Climate Change

In recent years, there has been continued discussion about climate changes that are being experienced around the world. While there are varied opinions on causes and ultimate effects, it is recognized that changing weather patterns may contribute to rising sea levels which could significantly affect both inland and coastal communities. Regardless of the causes of climate change, as well as the pace and magnitude of such changes, it is essential that communities appropriately plan for changing trends and adjust their development patterns to minimize potential adverse impacts.

Possible sea level rise in conjunction with shoreline erosion and coastal subsidence (or sinking) is a concern for coastal Virginia. This is especially important for populated areas in terms of property damage and safety concerns as well as in terms of potential impacts on natural communities responding to changes in vegetative patterns, wildlife populations, and chemical responses due to temperature variation, runoff, varied rainfall, etc.

Potential rising sea levels coupled with the potential for stronger storms pose increasing threats to coastal communities, infrastructure, beaches, wetlands, and sensitive ecosystems. With respect to the mid-Atlantic region, rising water levels, erosion and coastal subsidence already are affecting low-lying lands, eroding beaches, converting wetlands to open water, and exacerbating coastal flooding. Consequently, the County should consider additional approaches for adapting to a changing coastline. Short-term structural solutions (e.g., rip-rap revetments, breakwaters, bulkheads, elevating structures, etc.) will not sufficiently address all anticipated changes. Shifts are needed in federal, state and local policies with respect to more long-term land-use planning and environmental protection and preservation.



Land Use, Development and Redevelopment of Resource and Management Areas

Given development constraints and the potential long-term effects of climate change, future land development and redevelopment in Mathews County must be carefully planned and coordinated with environmental features. This includes not only new buildings and the rehabilitation of existing structures, but also the development of supporting public infrastructure. The next section on Land Use provides a more detailed analysis of existing land use and development patterns and presents recommendations for addressing outstanding issues and amending land development patterns to meet the goals of the future.

Environmental Challenges and Opportunities 2030

The environmental resources of Mathews County provide for the economic and social well-being of residents and businesses. Careful planning and management of the environment, and in particular water quality, must be a priority in order to sustain the quality of life that is cherished by citizens and visitors. The environmental resources in Mathews include complex ecosystems that are sensitive to such things as stormwater and agricultural runoff, inadequate wastewater treatment, soil erosion, and changes in temperature, rainfall and overall climate. All of these challenges are intended to be monitored and managed in conjunction with Chesapeake Bay and Clean Water regulations, among others; however, it takes many partners, extensive public education, and diligent communication to successfully achieve desired environmental goals and outcomes. Ultimately, clean water is essential to community health, safety and welfare. It will be important to pursue and emphasize effective means of monitoring and treating point and non-point source pollutants to achieve the water quality desired for Mathews County and the surrounding region. Traditionally, planning in Mathews County has focused only on land area within the County boundaries; changing the paradigm to expand planning beyond the land and over the water (still within County territorial boundaries) could significantly help to manage future water quality and minimize land use conflicts.

One of the most difficult challenges for Mathews County will be appropriately balancing the increasing conflicts regarding use of and access to the waterfront. Understandably, waterfront residents have personal interests for using and protecting their properties, while waterfront businesses have need for water access and the ability to engage in aquatic trades. In addition, citizens of the County have rights to the waterfront for access and recreation. Yet, underlying all of these interests are the sensitive environmental systems that must be recognized and protected in order to sustain the quality of life desired by all.

The potential rise in sea level should be one of the factors considered in future development patterns. Over time, it is probable that there will be changes in vegetation, the landscape, and flooding patterns. The projected degree of impact is widely discussed and varies among experts and designated study panels. Thus, to be most effective it is best be conservative when



Future Land Use

Given development constraints and environmental factors affecting Mathews County, land development patterns in the future should be more conservative than what exists today. Greater land use guidance and controls are needed in order to achieve the future vision set forth by Mathews' citizens and governmental officials. In addition, changing climate and sensitive environmental conditions present challenges for the future in order to protect properties, public health and overall community safety.

A future land use map is presented on the following page. This map was developed based on various factors including Chesapeake Bay Preservation Areas, wetlands, land elevations, proximity to the proposed sanitary sewer transmission force main, and potential coastal changes from rising sea levels. While the future land use map recognizes the need to respect existing land uses and property rights, serious consideration must be given to shifting development patterns in the future to the best suited areas to address future challenges. More detailed discussion of the future land use categories is on the following pages.

In addition, Mathews County supports preservation of land through conservation or open-space easements. The preservation of open space is viewed as desirable and compatible with the land management recommendations of this Comprehensive Plan, even in areas where the Future Land Use Map may recommend a different or more intensive land use.

Appendix F:

Gloucester County Resolution – Floodplain Management Ordinance Amendments

At a meeting of the Gloucester County Board of Supervisors held on August 3, 2010 in the Colonial Courthouse, located at 6504 Main Street, Gloucester, Virginia: On a motion duly made by _____, and seconded by _____ the following Ordinance was adopted by the following vote:

- Carter M. Borden, _____
- Robert A. Crewe, _____
- John H. Northstein, _____
- Michelle R. Ressler, _____
- Christian D. Rilee, _____
- Louise D. Theberge, _____
- Gregory Woodard, _____

AN ORDINANCE AMENDING CHAPTER 8.5 – FLOODPLAIN MANAGEMENT OF THE GLOUCESTER COUNTY CODE

WHEREAS, Gloucester County has adopted and enforces the Virginia Uniform Statewide Building Code (VUSBC), and Gloucester County Code Chapter 8.5-Flood Plain Management (Chapter 8.5), which contain requirements for buildings that are constructed or substantially improved in areas that are within federally designated flood plain boundaries and prone to flooding; and

WHEREAS, to the benefit of property owners within federally designated floodplain boundaries, the County has participated in the Department of Homeland Security’s Federal Emergency Management Agency (FEMA) National Flood Insurance Program (NFIP) since adoption of Chapter 8.5 on July 7, 1987, revised September 6, 1994; and

WHEREAS, FEMA has completed a new Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) for the County, both which will become effective on September 17, 2010; and

WHEREAS, the FEMA Regional Office is required to approve legally enforceable floodplain management measures adopted by the County by September 17, 2010 to continue the County’s eligibility for participation in NFIP; and

WHEREAS, County staff has drafted changes to Chapter 8.5 to effect the requirements of FEMA; and

WHEREAS, County staff has recommended and included within the proposed revisions an additional one (1) foot of freeboard clearance to the existing elevation requirements for new or substantially improved structures within the flood zones designated by the FIRM; and

WHEREAS, as required, the State Department of Conservation and Recreation (DCR) has approved the proposed changes to Chapter 8.5; and

WHEREAS, for the health and safety of the citizens of Gloucester County, the Board is desirous of revising the Gloucester County Code to effect this program and the Board is desirous of amending Chapter 8.5 of the Gloucester County Code to reflect the code provisions required by FEMA, and recommended by County staff; and

WHEREAS, a public hearing was held on August 3, 2010 to receive public comment regarding these proposed amendments to the Gloucester County Code; and

WHEREAS, once the proposed amendments to the Gloucester County code are adopted, FEMA must review and approve the code amendment by September 17, 2010.

NOW THEREFORE BE IT ORDAINED AND ENACTED that Chapter 8.5 – Floodplain Management be amended, as follows:

Chapter 8.5 FLOODPLAIN MANAGEMENT
Article I. In General

- § 8.5-1. Title.
- § 8.5-2. Definitions.
- § 8.5-3. Statement of intent.
- § 8.5-4. Authority.
- § 8.5-5. Purpose.
- § 8.5-6. Applicability.
- § 8.5-7. Compliance required.
- § 8.5-8. Abrogation and greater restrictions.
- § 8.5-9. Existing structures in floodplain district.
- § 8.5-10. Penalties.
- § 8.5-11. Warning and disclaimer of liability.
- § 8.5-12. Severability.

Article II. Establishment of Floodplain Districts

- § 8.5-21. Basis of districts.
- § 8.5-22. Official floodplain map.
- § 8.5-23. District boundary changes.
- § 8.5-24. Interpretation of district boundaries.
- § 8.5-25. Designated official.
- § 8.5-26. Submitting technical data.

Article III. District Provisions

- § 8.5-36. General requirements.
- § 8.5-37. Floodway District (~~AE zones~~).
- § 8.5-38. Flood-fringe and approximated floodplain districts (AE and A zones).
- § 8.5-39. Coastal high hazard area district (V and VE zones).
- § 8.5-40. Critical facilities.
- § 8.5-41. Specific Standards.

Article IV. Administrative Provisions

- § 8.5-51. Permit requirements.
- § 8.5-52. Variances.

ARTICLE I. IN GENERAL

Sec. 8.5-1. Title.

This chapter shall be known and may be cited as the Floodplain Management Ordinance of Gloucester County, Virginia.

Sec. 8.5-2. Definitions.

For the purposes of this chapter:

Area of special flood hazard means land in the community flood plain subject to a one (1) percent or greater chance of flooding in any given year. The area may be designated as Zone A, AE, V, or VE on the official Flood Insurance Rate Map (FIRM) for Gloucester County.

Base flood elevation (BFE) means the Federal Emergency Management Agency designated one-hundred-year water surface elevation plus ~~one (1)~~ **two (2)** more ~~feet~~ **feet** for new construction only.

Base flood/one hundred-year flood means a flood that, on the average, is likely to occur once every one hundred (100) years, or that has a one (1) percent chance of occurring each year, although the flood may occur in any year.

Basement means any area of a building having its floor subgrade (below ground level) on all sides.

Board of contractor appeals means the board appointed to review appeals made by individuals with regard to decisions of the building official in the interpretation of this chapter, as defined by section 5-35, et seq., of this Code.

Breakaway wall means a wall that is not part of the structural support of the building and is intended through its design and construction to collapse under specific lateral loading forces, without causing damage to the elevated portion of the building or supporting foundation system.

Buffer modification means an approved reduction of the one-hundred-foot resource protection area buffer, as defined by section 5.5-3 of this Code.

~~***Chesapeake Bay Preservation Ordinance Administrative Board* means a group of five (5) county employees appointed by the county administrator that evaluates buffer modification and reserve drainfield waiver requests, pursuant to Chapter 5.5 of the Gloucester County Code.**~~

Coastal high hazard area means an area of special flood hazard extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high velocity wave action from storms or seismic sources.

Critical facility means those structures or facilities which produce, use or store highly volatile, flammable, explosive, toxic and/or water-reactive materials; hospitals, nursing homes and housing which are likely to contain occupants who may not be sufficiently mobile to avoid death or injury during a flood event; police stations, vehicle and equipment storage facilities and emergency operations centers which are needed for flood response activities before, during and after a flood event; and public and private utility facilities which are vital to maintaining or restoring normal services to flooded areas before, during and after a flood event. Structures used solely for private residential purposes are excluded from this definition.

Development means any man-made change to improved or unimproved real estate, including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation, or drilling operations or storage of equipment or materials.

Flood means a temporary inundation of normally dry land areas.

Flood-related erosion means the collapse or subsidence of land along the shore of a lake or other body of water as a result of undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature, such as a flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding.

Flood-related erosion area or flood-related erosion prone area means a land area adjoining the shore of a lake or other body of water, which due to the composition of the shoreline or bank and high water levels or wind-driven currents, is likely to suffer flood-related erosion damage.

Floodplain means (1) a relatively flat or low land area adjoining a river, stream or watercourse which is subject to partial or complete inundation; **or** (2) an area subject to the unusual and rapid accumulation or runoff of surface waters from any source.

Floodproofing means any combination of structural and nonstructural additions, changes or adjustments to properties and structures which reduce or eliminate flood damage to lands, water and sanitary facilities, structures and contents of buildings.

Floodway fringe means the area between the floodway and one hundred-year floodplain boundaries. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water surface elevation of the one hundred-year flood by more than one (1.0) foot at any point (shown on FIRM).

Freeboard means a factor of safety usually expressed in feet above a flood level for purposes of floodplain management.

Functionally dependent use means a use which cannot perform its intended purpose unless it is located or carried out in close proximity to water. The term includes only docking facilities, port facilities that are necessary for the loading and unloading of cargo or passengers, and shipbuilding and ship repair facilities, but does not include long-term storage or related manufacturing facilities.

Highest adjacent grade means the highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

Historic structure means any structure that is:

(a) Listed individually in the National Register of Historic Places;

(b) Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district;

(c) Individually listed on the Virginia inventory of historic places; or

(d) Individually listed on the local inventory of historic places that has been certified by and approved by the state program.

Land development means (i) the improvement of one (1) lot, or two (2) or more contiguous lots, tracts, or parcels of land for any purpose involving (a) a group of two (2) or more buildings, or (b) the division or allocation of land or space between or among two (2) or more existing or prospective occupants by means of, or for the purpose of, streets, common areas, leaseholds, condominiums, building groups or other features; **or** (ii) a subdivision of land.

Lowest floor means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor; provided, that such enclosure is not built so as to render the structure in violation of the applicable nonelevation design requirements of this chapter.

Manufactured home means a structure subject to federal regulation, which is transportable in one or more sections; is eight body feet or more in width and forty body feet or more in length in the traveling mode, or is 320 or more square feet when erected on site; is built on a permanent chassis; and is designed to be used as a single-family dwelling, with or without a permanent foundation, when connected to the required utilities.

Mean sea level means, for purposes of the National Flood Insurance Program, the National Geodetic Vertical Datum (NGVD) of **1929 1988** or other datum, to which base flood elevation shown on a community's flood insurance rate map are referenced.

New construction means **for the purposes of determining insurance rates, structures for which the “start of construction” commenced on or after August 4, 1987, and includes any subsequent improvements to such structures. For flood plain management purposes, new construction means** structures for which the start of construction as herein defined commenced on or after the effective date of this chapter **and includes any subsequent improvements to such structures. This term does not apply to any work on a structure existing before the effective date of this chapter.**

Nonconforming structures means a structure or use of a structure or premises which lawfully existed before the enactment of these provisions.

Principally above ground means where at least fifty-one (51) percent of the actual cash value of a structure, less land value, is above ground.

Recreational vehicle means a vehicle which is built on a single chassis; contains four hundred feet (400) square feet, or less, when measured at the largest horizontal projection; **is** designed to be self-propelled or permanently towable by a light duty truck; and **is** designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational camping, travel, or seasonal use.

Regulatory floodway means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height (one (1) foot).

Resource protection area (RPA) means lands at or near the shoreline that have an intrinsic value to water quality due to the ecological and biological processes they perform, or are sensitive to impacts which may result in significant degradation to the quality of state waters. This definition includes tidal wetlands, tidal shores, non-tidal wetlands adjacent to tidal wetlands, and a one hundred (100) foot buffer area adjacent to and landward of the components listed above, and along both sides of any perennial stream, all as defined in section 5.5-3 of this Code.

Structure means a walled and roofed building, including a gas or liquid storage tank, that is principally above ground, as well as a manufactured home.

Subdivision means the division or redivision of lots, tracts, or parcels of land by any means into two (2) or more lots, tracts, parcels, or other divisions of land, including a change in existing lot lines for the purpose, whether immediate or future, of lease, transfer of ownership, or building, or lot development.

Substantial damage means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damaged condition would equal or exceed fifty (50) percent of the market value of the structure before the damage occurred.

Substantial improvement means any repair, reconstruction, or improvement of a structure, the cost of which equals or exceeds fifty (50) percent of the market value of the structure either (a) before the improvement or repair is started, or (b) if the structure has been damaged and is being restored, before the damage occurred. For the purposes of this definition, "substantial improvement" is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure. The term does not, however, include either (1) any project for improvement of a structure to comply with existing state or local health, sanitary, or safety code specifications which are solely necessary to assure safe living conditions, or (2) any alteration of a structure listed on the National Register of Historic Places or a state inventory of historic places.

Variance means a grant of relief by a community from the terms of a floodplain management regulation.

Violation means the failure of a structure or other development to be fully compliant with Gloucester County's flood plain management regulations.

Water dependent use or facility means a development of land that cannot exist outside of the resource protection area (RPA) and must be located on the shoreline because of the intrinsic nature of its operation. These facilities include, but are not limited to, ports, the intake and outfall structures of power plants, water treatment plants, sewage treatment plants, and storm sewers, as well as marinas, boat docking structures, beaches and other public water orientated recreation areas, and fisheries and other marine resource facilities.

Sec. 8.5-3. Statement of intent.

These regulations shall apply to all property located within an area identified as being subject to inundation by water of the one hundred-year flood event, and as such shall supplement the regulations of the zoning district within which such property is located. These regulations are intended to ensure the health, safety and general welfare of the public by ensuring that inhabitants and property within a designated floodplain area are safe from damage **due** to flooding ~~and will not endanger others~~. This chapter complies with the requirements of the National Flood Insurance Program (42 U.S.C. 4001--4128) of the Federal Insurance Administration. These regulations are necessary in order for all property owners within the county to be eligible for the National Flood Insurance Program and thereby purchase such insurance at nominal rates. Where these regulations are at variance with the general regulations of the county, it is intended that these regulations shall apply.

Sec. 8.5-4. Authority.

This chapter is adopted pursuant to the authority granted by ~~Title 62.1, Chapter 3.5, sections 62.1-44.108 through 62.1-44.112 of the Code of Virginia, 1950, as amended~~ **Va. Code Sections 15.2-2280 and 10.1-600 et seq., and all amendments thereto.**

Sec. 8.5-5. Purpose.

The purpose of these provisions is to prevent the loss of property and life, the creation of health and safety hazards, the disruption of commerce and governmental services, the extraordinary and unnecessary expenditure of public funds for flood protection and relief, and the impairment of the tax base by:

- (1) Regulating uses, activities and development which, acting alone or in combination with other existing or future uses, activities and development, will cause unacceptable increases in flood heights, velocities and frequencies;
- (2) Restricting or prohibiting certain uses, activities and development from locating within areas subject to flooding;
- (3) Requiring all those uses, activities, and developments that do occur in flood-prone areas to be protected and/or flood-proofed against flooding and flood damage;
- (4) Protecting individuals from buying lands and structures which are unsuited for intended purposes because of flood hazards.

Sec. 8.5-6. Applicability.

These provisions shall apply to all lands within the jurisdiction of Gloucester County, Virginia, and identified as areas subject to inundation by water of the one hundred-year flood event.

Sec. 8.5-7. Compliance.

No land shall hereafter ~~by be~~ developed and no structure shall be located, relocated, constructed, reconstructed, enlarged, or structurally altered except in full compliance with the terms and provisions of this chapter and any other applicable ordinances and regulations.

Sec. 8.5-8. Abrogation and greater restrictions.

This chapter supersedes any ordinance currently in effect in flood-prone areas. However, any underlying ordinance shall remain in full force and effect to the extent that those provisions are more restrictive.

Sec. 8.5-9. Existing structures in floodplain district.

A structure or use of a structure or premises which lawfully existed before the enactment of these provisions, but which is not in conformity with these provisions, may be continued subject to the following conditions:

The modification, alteration, repair, reconstruction or improvement of any kind to a structure and/or use regardless of its location in a floodplain district to an extent or amount of fifty (50) percent or more of its market value shall be undertaken only in full compliance with the provisions of the Virginia Uniform Statewide Building Code and this chapter.

Sec. 8.5-10. Penalties.

Any person who fails to comply with any or all of the requirements or provisions of this chapter or direction of the building official or any other authorized employee of the county shall be guilty of an offense and, upon conviction, shall pay a fine to the County of Gloucester, Virginia, of not less than twenty-five dollars (\$25.00) nor more than one thousand dollars (\$1,000.00). Each day during which any violation of this chapter continues shall constitute a separate offense. In addition to the above penalties, all other actions are hereby reserved including an action ~~in equity~~ for the proper enforcement of this chapter. The imposition of a fine or penalty for any violation of, or noncompliance with, this chapter shall not excuse the violation or noncompliance or permit it to continue; and all such person[s] shall be required to correct or remedy such violations or noncompliances within a reasonable time. Any structure constructed, reconstructed, enlarged, altered or relocated in noncompliance with this chapter may be declared by the board of supervisors to be a public nuisance and abatable as such.

Sec. 8.5-11. Warning and disclaimer of liability.

The degree of flood protection required by the floodplain management ordinance of Gloucester County, Virginia, is considered reasonable for regulatory purposes and is based on engineering and scientific methods of study. Larger floods may occur on rare occasions. Flood heights may be increased by man-made or natural causes. This chapter and the districts established hereby shall not create liability on the part of the county or any officer, agency or employee thereof for any flood damage that results from reliance on this chapter or any administrative decision lawfully made hereunder.

Sec. 8.5-12. Severability.

If any section, subsection, paragraph, sentence, clause, or phrase of this chapter shall be declared invalid for any reason whatsoever, such decision shall not affect the remaining portions of this chapter. The remaining portions shall remain in full force and effect, and for this purpose, the provisions of this chapter are hereby declared to be severable.

ARTICLE II. ESTABLISHMENT OF FLOODPLAIN DISTRICTS

Sec. 8.5-21. Basis of districts.

The various floodplain districts shall include areas subject to inundation by waters of the one hundred-year flood. The basis for the delineation of these districts shall be the Flood Insurance Study (FIS) and the Flood Insurance Rate Map (FIRM) for Gloucester County prepared by the Federal Emergency Management Agency, Federal Insurance Administration, dated ~~August 4, 1987~~ September 17, 2010, as amended.

- (1) The floodway district (~~AE zones~~) is delineated, for purposes of this chapter, using the criterion that certain areas within the floodplain must be capable of carrying the waters of the one hundred-year flood without increasing the water surface elevation of that flood more than one (1) foot at any point. The areas included in this district are specifically defined in Table 5 of the above-referenced flood insurance [study] and shown on the accompanying flood insurance rate map.
- (2) The flood-fringe district (AE zones) shall be that area of the one hundred-year floodplain not included in the floodway district. The basis for the outermost boundary of the district shall be the one hundred-year flood elevations contained in the flood profiles of the above-referenced flood insurance study and as shown on the accompanying flood insurance rate map.
- (3) The approximated floodplain district (A zones) shall be that floodplain area for which no detailed flood profiles or elevations are provided, but where a one hundred-year floodplain boundary has been approximated. Such areas are shown as Zone A on the maps accompanying the flood insurance study. For these areas, the one hundred-year flood elevations and floodway information from federal, state, and other acceptable sources shall be used, when available. Where the specific one hundred-year flood evaluation cannot be determined for this area using other sources of data, such as the U.S. Army Corps of Engineers Floodplain Information Reports, U.S. Geological Survey Flood-Prone Quadrangles, etc., then the applicant for the proposed use, development and/or activity shall determine this elevation in accordance with hydrologic and hydraulic engineering techniques. Hydrologic and hydraulic analysis shall be undertaken only by professional engineers or others of demonstrated qualifications, who shall certify that the technical methods used correctly reflect currently accepted technical concepts. Studies, analyses, computations, etc., shall be submitted in sufficient detail to allow a thorough review by Gloucester County ~~Office of~~ **Community Development and Codes Compliance**.
- (4) Coastal high-hazard areas district (V and VE zones) shall be those portions of land within the coastal floodplain subject to inundation by high velocity waters and wave action.

Sec. 8.5-22. Official floodplain map.

The boundaries of the floodplain districts are established as shown on the flood insurance rate maps which are declared to be a part of this chapter and which shall be kept on file at the county office of ~~community development and~~ codes compliance.

Sec. 8.5-23. District boundary changes.

The delineation of any of the floodplain districts may be revised by the board of supervisors where natural or man-made changes have occurred and/or more detailed studies conducted or undertaken by the U.S. Army Corps of Engineers or other qualified agency or individual documents the need for such change. However, prior to any such change, approval must be obtained from the Federal Insurance Administration.

Sec. 8.5-24. Interpretation of district boundaries.

Initial interpretation of the boundaries of the floodplain districts shall be made by the director of ~~community development and~~ codes compliance. Should a dispute arise concerning the boundaries of any of the districts, the board of contractor appeals shall make the necessary determination. The person questioning or contesting the location of the district boundary shall be given a reasonable opportunity to present his case to the board of contractor appeals and to submit his own technical evidence if he so desires.

Sec. 8.5-25. Designated official.

The director of ~~community development and~~ codes compliance is designated to coordinate the implementation of this article and to submit an annual report to the administrator of the National Flood Insurance Program concerning such implementation.

Sec. 8.5-26. Submitting technical data.

The county's base flood elevations may increase or decrease resulting from physical changes affecting flooding conditions. As soon as practicable, but not later than six months after the date such information becomes available, the county shall notify the Federal Insurance Administrator of the changes by submitting technical or scientific data. Such submission is necessary so that upon confirmation of those physical changes affecting flooding conditions, risk premium rates and floodplain management requirements will be based upon current data.

ARTICLE III. DISTRICT PROVISIONS

Sec. 8.5-36. General requirements.

- (a) All uses, activities and development occurring within any floodplain district shall be undertaken only upon the issuance of a building permit. Such development shall be undertaken only in strict compliance with the provisions of this chapter and with all other applicable codes and ordinances such as the Gloucester County Zoning Ordinance, the Gloucester County Wetlands Zoning Ordinance [Chapter 20], the Gloucester County Soil and Erosion Sedimentation Control Ordinance [Chapter 7.5], the Gloucester County Site Plan Ordinance [Chapter 15.5], the Gloucester County Subdivision Ordinance [Chapter 15], the Gloucester County Chesapeake Bay Preservation Ordinance [Chapter 5.5], and the Virginia Uniform Statewide Building Code [Chapter 5, Article I]. Prior to the issuance of any such permit, the building official shall require all applications to include compliance with all applicable state and federal laws.
- (b) Under no circumstances shall any use, activity, and/or development adversely affect the capacity of the channels or floodways of any watercourse, drainage ditch, or any other drainage facility or system.
- (c) Prior to any proposed alteration or relocation of any channels or of any water course, stream, etc., within this jurisdiction, an approved permit shall be obtained from the U.S. Army Corps of Engineers, the Virginia Department of

Environmental Quality (DEQ), and the Virginia Marine Resources Commission (a joint permit application is available from any of these organizations or from the ~~Office of Development Community and Codes Compliance~~). Furthermore, notification of the proposal shall be given by the applicant to all affected adjacent jurisdictions, the Department of Conservation and Recreation (Division of Soil and Water Conservation) and the Federal Insurance Administration.

- (d) All proposals for the subdivision of land and/or new development shall include a plan drawing showing the location of all existing and proposed public and private utilities, facilities and drainage structures. If the one hundred-year flood elevation has been determined by the flood insurance study or other reliable source approved by the County of Gloucester, Virginia, such flood elevation shall be delineated on the proposed plan, provided that the more stringent elevation data shall control. In addition, within the approximated floodplain district, flood and floodway information from federal, state, or other acceptable sources shall be used when available. If the proposal is greater than fifty (50) lots or greater than five (5) acres, whichever is the lesser, and the one hundred-year flood elevation has not been determined for the land area, the developer shall determine the one hundred-year flood elevation and delineate such flood elevation on the proposed plan. **Until a regulatory floodway is designated, no new construction, substantial improvements, or other development, including fill, shall be permitted within Zone AE on the FIRM, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.** All plans shall be certified by a registered professional engineer and shall be reviewed by the subdivision agent to assure that:
- (1) All such proposals are consistent with the need to minimize flood damage;
 - (2) All necessary permits have been received from the State of Virginia and appropriate federal agencies;
 - (3) All public and private utilities and facilities (including sewer, water, telephone, electric, gas, etc.) are located and constructed to minimize or eliminate flood damage. **New and replacement sanitary sewage systems are to be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters as approved and permitted by the State Health Department for private systems and the Gloucester County department of public utilities for public systems;**
 - (4) Adequate drainage is provided to reduce exposure to flood hazard. Storm drainage facilities shall be designed to convey the flow of stormwater runoff in a safe and efficient manner. The system shall ensure proper drainage along streets, and provide positive drainage away from buildings. The system shall also be designed to prevent the discharge of excess runoff onto adjacent properties; **and**
 - (5) Adequate measures have been taken to minimize the adverse environmental impacts of the proposed development.
- (e) Recreational vehicles placed on sites **shall** either: (1) be on the site for fewer than one hundred eighty (180) consecutive days **and** be fully licensed and ready for highway use, or (2) meet the permit requirements for placement and the elevation and anchoring requirements for manufactured homes as contained in

- the Uniform Statewide Building Code. A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions.
- (f) All new buildings must be constructed on properly designed and compacted fill (ASTM D-698 or equivalent) that extends beyond the building walls before dropping below the base flood elevation and has appropriate protection from erosion and scour. The design of the fill or the fill standard must be approved by a registered engineer.
 - (g) Where a nonresidential structure is intended to be made watertight below the base flood level, (i) a registered professional engineer or architect shall develop and/or review structural design, specifications, and plans for the construction, and shall certify that the design and methods of construction are in accordance with accepted standards of practice for meeting the applicable provisions of this chapter, and (ii) a record of certificate which includes the specific elevation (in relation to mean sea level) to which such structures are floodproofed shall be maintained with the director of ~~community development and~~ codes compliance.
 - (h) Man-made alterations to sand dunes that would increase potential flood damage are prohibited.**

Sec. 8.5-37. Floodway district (AE zones).

In the floodway district, no encroachments, including fill, new construction, substantial improvements, or other development shall be permitted unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in the one hundred-year flood evaluation.

Sec. 8.5-38. Flood-fringe and approximated floodplain districts (AE and A zones).

In the flood-fringe and approximated floodplain districts, the development and/or use of land shall be permitted in accordance with the regulations of the underlying area, provided that all such uses, activities, and/or development shall be undertaken in strict compliance with the floodproofing and related provisions contained in the Virginia Uniform Statewide Building Code and all other applicable codes and ordinances.

Within the approximated floodplain district, the applicant shall also delineate a floodway area based on the requirement that all existing and future development not increase the one hundred-year flood elevation more than one (1) foot at any one (1) point. The engineering principle--equal reduction of conveyance--shall be used to make the determination of increased flood heights.

Within the floodway area delineated by the applicant, the provisions of section 8.5-37 shall apply.

Sec. 8.5-39. Coastal high hazard district (V and VE zones).

In the coastal high hazard area district (V and VE zones), the following regulations shall apply in addition to the regulations cited in sections 8.5-36 through 8.5-38:

- (1) No land below the level of the one hundred-year flood event may be developed unless the new construction or substantial improvement is located outside the resource protection area (RPA) (measured landward one hundred (100) feet from the mean high tide or associated tidal wetlands) or a buffer modification to the

RPA requirement has been granted by the Chesapeake Bay Preservation Ordinance Administrative Board. This one hundred-foot buffer requirement excludes water dependent uses as defined;

- (2) All manufactured homes to be placed or substantially improved within V or VE zones shall comply with the same standards as set forth for conventional housing in V or VE zones.
- (3) There shall be no fill used as structural support.
- (4) Existing nonconforming uses and/or structures located on land below the level of the one hundred-year flood event shall not be expanded.
- ~~(5) Within V zones on the flood insurance rate map, obtain and record the elevation (in relation to mean sea level) of the bottom of the lowest horizontal structural member of the lowest floor (excluding pilings and columns) of all new and substantially improved structures, and whether or not such structures contain a basement on permit applications.~~
- (5) All new construction and substantial improvements in Zones V and VE shall be elevated on pilings or columns so that:**
 - a. the bottom of the lowest horizontal structural member of the lowest floor (excluding the pilings or columns) is elevated two feet above the base flood level; and**
 - b. the pile or column foundation and structure attached thereto is anchored to resist flotation, collapse, and lateral movement due to the effects of wind and water loads acting simultaneously on all building components.**

Sec. 8.5-40. Critical facilities.

The building of critical facilities in the five hundred-year floodplain is prohibited.

Sec. 8.5-41. Specific Standards.

In all special flood hazard areas where base flood elevations have been provided in the Flood Insurance Study or in the case of areas for which no detailed flood profiles or elevations are provided, the one hundred (100) year flood elevations and floodway information from federal, state, and other acceptable sources shall be used when available. All new construction and substantial improvements shall be designed (or modified) and adequately anchored to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, and be constructed by methods and practices that minimize flood damages using materials that are resistant to flood damage, with the electrical, heating, ventilation, plumbing, and air conditioning equipment and other services so designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding. The following provisions shall apply:

(1) Residential Construction

New construction or substantial improvement of any residential structure (including manufactured homes) shall have the lowest floor, including basement, elevated no lower than two feet above the base flood elevation.

(2) Non-Residential Construction

New construction or substantial improvement of any commercial, industrial, or non-residential building shall have the lowest floor, including basement, elevated to no lower than two feet above the base flood elevation. Buildings located in all A or AE zones may be flood-proofed in

lieu of being elevated, provided that all areas of the building components below the base flood elevation are water tight with walls substantially impermeable to the passage of water, and use structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effect of buoyancy. A registered professional engineer or architect shall certify that the standards of this subsection are satisfied. Such certification, including the specific elevation to which such structures are floodproofed, shall be maintained in the codes compliance office.

(3) Elevated Buildings

Fully enclosed areas of new construction or substantially improved structures, which are below the regulatory flood protection elevation, shall:

a. Not be designed or used for human habitation, but shall only be used for parking of vehicles, building access, or limited storage.

b. Be constructed entirely of flood resistant materials below the regulatory flood protection elevation.

c. Include in Zones A and AE measures to automatically equalize hydrostatic flood forces on walls by allowing for the entry and exit of floodwaters. To meet this requirement, the openings must be certified by a professional engineer or architect, or meet the following minimum design criteria:

i. Provide a minimum of two openings on different sides of each enclosed area subject to flooding.

ii. The total net area of all openings must be at least one (1) square inch for each square foot of enclosed area subject to flooding.

iii. If a building has more than one enclosed area, each area must have openings to allow floodwaters to automatically enter and exit.

iv. The bottom of all required openings shall be no higher than one (1) foot above the adjacent finished grade.

v. Openings may be equipped with screens, louvers, or other opening coverings or devices, provided they permit the automatic flow of floodwaters in both directions.

vi. The inside finished grade of each enclosed area must be as high or higher than the outside finished grade.

vii. Foundation enclosures made of flexible skirting are not considered enclosures for regulatory purposes, and therefore, do not require openings. Masonry or wood underpinning, regardless of structural status, is considered an enclosure and requires openings as outlined above.

d. In Zones V and VE, a registered design professional engineer or architect shall develop and seal the structural design, specifications and plans for the construction, and shall certify that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting the provisions of Article III, Sec. 8.5-39.

i. The space below the lowest floor shall be either free of obstruction or constructed with nonsupporting breakaway walls, open wood-lattice work, or insect screening intended to collapse under wind and water loads without causing collapse, displacement, or other structural damage to the elevated portion of the building or supporting foundation system;

- ii. Breakaway walls shall collapse from water loads that are less than that which would occur during the base flood; and,
- iii. The elevated portion of the building and supporting foundation shall not be subject to collapse, displacement or other structural damage due to the effects of wind and water loads acting simultaneously on all building components. Water loading values used shall be those associated with the base flood. Wind loading shall be those required by the Virginia Uniform Statewide Building Code (USBC). The enclosed space below the lowest floor shall be used solely for parking of vehicles, building access, or storage.

(4) Standards for Manufactured Homes

- a. Individual Lots. All manufactured homes placed, or substantially improved, on individual lots or parcels must meet all of the elevation requirements for new construction. They shall be placed on reinforced piers or other equivalent foundation elements and anchored to prevent flotation, collapse, or lateral movement. Methods of anchoring may include, but are not limited to, use of over-the-top or frame ties to appropriate ground anchors. This standard shall be in addition to and consistent with manufacturers' requirements for resisting wind forces.
- b. Manufactured Home Parks. All manufactured homes placed or substantially improved in an existing manufactured home park in which a manufactured home has not incurred substantial damage as the result of a flood shall be elevated so that either:
 - i. the lowest floor of the manufactured home is elevated no lower than two (2) feet above the base flood elevation; or
 - ii. the manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than 36 inches in height above adjacent grade, and be securely anchored to an adequately anchored foundation system to resist flotation, collapse and lateral movement.

ARTICLE IV. ADMINISTRATIVE PROVISIONS

Sec. 8.5-51. Permit requirements.

A permit is required for all development (including, but not limited to, the subdivision of land, construction of buildings and structures, placement of manufactured homes, fill or any combination of these) in the floodplain district and shall be granted only after necessary permits from all applicable local, state and federal agencies have been obtained. **The director of codes compliance or his designee shall review all proposed development to assure it is reasonably safe from flooding.**

- (1) The application for a building permit shall contain information including, but not limited to, the following:
 - a. Name and address of applicant. The applicant must be the owner or any authorized agent of the owner.
 - b. Name and address of owner of land on which construction is proposed.
 - c. Name and address of contractor.
 - d. Site location.
 - e. A plan of the site showing the size and location of the proposed construction as well as any existing buildings or structures.
 - f. Summary description of proposed work and estimate cost.

- g. Topographic information showing existing and proposed ground elevations.
- h. Depending on the type of structure involved, the following information shall also be included in the application:

For the structures to be elevated above the one hundred-year flood elevation, the plans shall show:

1. The size of the proposed structure(s) and its relation to the lot where it is to be constructed.
 2. The elevations of the proposed final grading and lowest floor, and the existing ground and one hundred-year flood elevation as certified by a registered professional engineer, surveyor or architect.
 3. The method of elevating the proposed structure, including details of proposed fills, pile structures, retaining walls, foundations, erosion protection measures, etc. These plans shall be prepared by a registered professional engineer or architect.
- (2) Upon completion of construction and prior to the issuance of the occupancy permit, the elevation certificate shall be completed and submitted to the building official who shall ensure that construction is in accordance with this chapter. If the structure has been floodproofed, the elevation to which the structure has been floodproofed shall also be supplied. **Records of actions associated with the administration of this chapter shall be kept on file and maintained by the director of codes compliance.**

Sec. 8.5-52. Variances.

(a) *Appeal procedure.* Whenever any person is aggrieved by a decision of the building official with respect to the provisions of this chapter, it is the right of that person to appeal to the board of contractor appeals for a variance. Such appeal must be filed, in writing, within thirty (30) days after the determination by the building official. Upon receipt of such an appeal, the board of contractor appeals shall set a time and place for the purpose of hearing the appeal, which shall be not less than ten (10) nor more than thirty (30) days from the date of receipt of the appeal. Notice of the time and place of the hearing **if of the appeal** shall be given to all parties at which time they may appear and be heard. The determination by the board of contractor appeals shall be final in all cases.

(b) *Consideration and issuance of variances.*

- (1) In passing upon applications for variances, the board of contractor appeals shall **satisfy consider** the following factors:
 - a. The danger to life and property due to increased flood heights or velocities caused by encroachments. No variance shall be granted for any proposed use, development or activity within any floodway area that will cause an increase in the one hundred-year flood elevation.
 - b. The danger that materials may be swept on to other lands or downstream to the injury of others.
 - c. The proposed water supply and sanitation systems and the ability of these systems to prevent disease, contamination, and unsanitary conditions.
 - d. The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owners.
 - e. The importance of the services provided by the proposed facility to the community.
 - f. The requirements of the facility for a waterfront location.

- g. The availability of alternative locations not subject to flooding for the proposed use.
- h. The compatibility of the proposed use with existing development and development anticipated in the foreseeable future.
- i. The relationship of the proposed use to the comprehensive plan and floodplain management program for the area.
- j. The safety of access to the property in time of flood of ordinary and emergency vehicles.
- k. The expected heights, velocity, duration, rate of rise, and sediment transport of the floodwaters expected at the site.
- l. The repair or rehabilitation of historic structures upon a determination that the proposed repair or rehabilitation will not preclude **the any** structure's continued designation as a historic structure and the variance is the minimum necessary to preserve the historic character and design of the structure.
- m. **A showing of good and sufficient cause and s**uch other factors which are relevant to the purposes of this chapter.

(2) The board of contractor appeals may refer any application and accompanying documentation pertaining to any request for a variance to any engineer or other qualified person or agency for technical assistance in evaluating the proposed project in relation to flood heights and velocities, and the adequacy of the plans for protection and other related matters.

(3) Variances shall only be issued after the board of contractor appeals has determined that the granting of such will not result in (a) unacceptable or prohibited increases in flood heights, (b) additional threats to public safety, (c) extraordinary public expense, (d) **create the creation of** nuisances, (e) **cause** fraud or victimization of the public, or (f) conflict with local laws or ordinances.

(4) **A variances** shall only be issued after the board of contractor appeals has determined that the variance will be the minimum relief to any hardship.

(5) The board of contractor appeals shall notify the applicant for a variance, in writing, that the issuance of a variance to construct a structure below the one hundred-year flood elevation (a) increases risks to life and property, and (b) will result in increased premium rates for flood insurance.

(6) A record of the above notification as well as all **variable variance** actions, including justification for their issuance, shall be maintained in the office of **community development and** codes compliance, and a record of all variances which are issued shall be noted in the annual report submitted to the Federal Insurance Administrator.

A copy teste: _____
 Brenda G. Garton, County Administrator