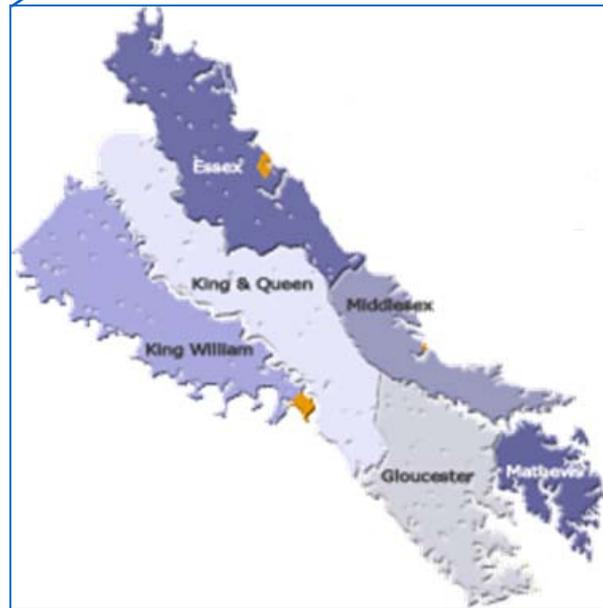
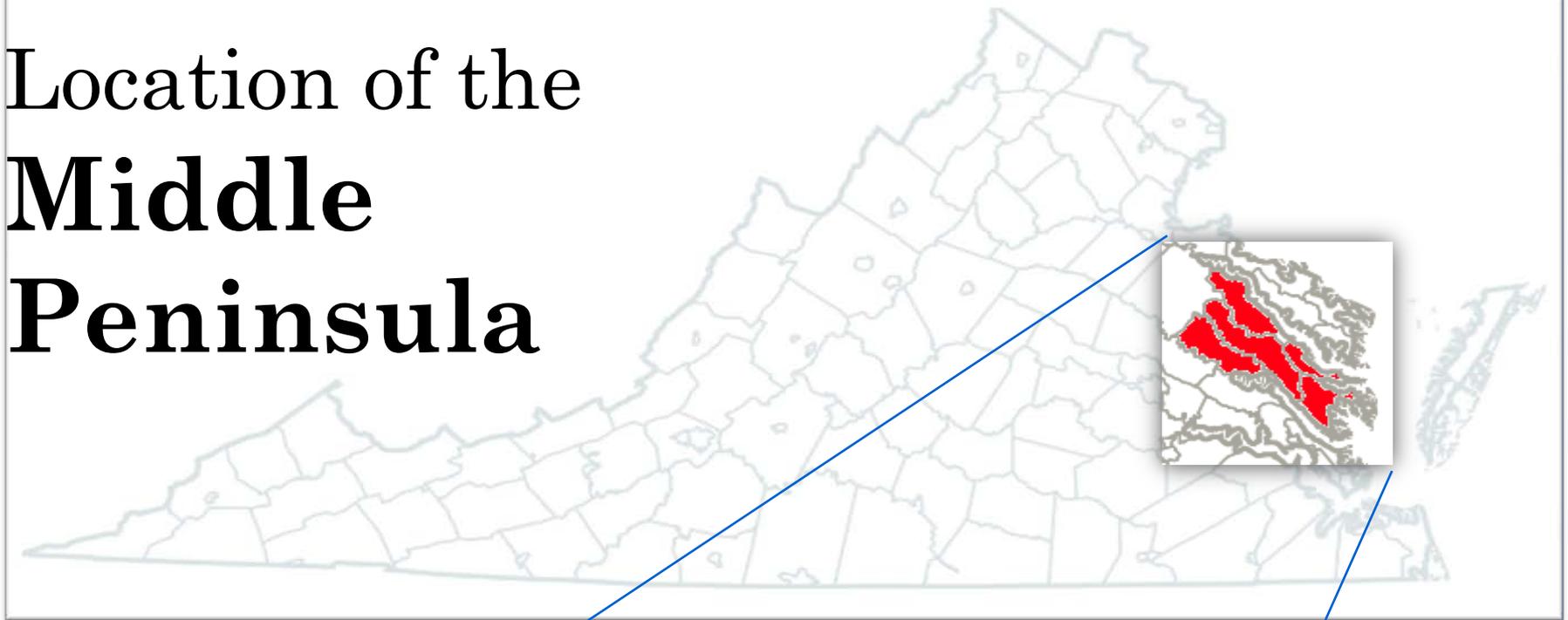


WHAT'S LOCAL GOVERNMENTS ROLE IN CLIMATE CHANGE?

MIDDLE PENINSULA PLANNING DISTRICT COMMISSION

**Climate Change Initiative – Identifying Impacts
and Working with Stakeholders**

Location of the **Middle Peninsula**



POWER OF THE BELIEF SYSTEM

- 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?)



The COCONUT TELEGRAPH



I hear that sea
level rise is fake!

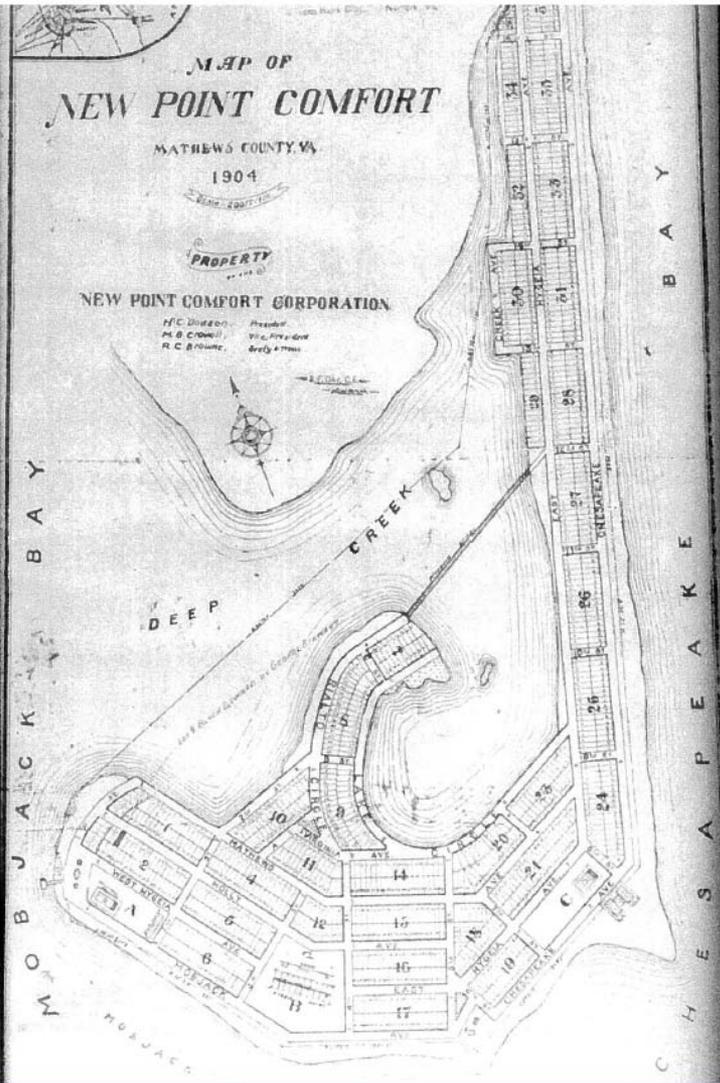


MATHEWS COUNTY BELIEFS?

- **“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.”**
- **“...wants to know why they were allowed to build there in the first place.”**



New Point Comfort Lighthouse Mathews, VA



TODAY- 5 ft water covers more than 1,000 plated subdivision lots



shoreline has moved 1/2 mile

1885



THIS PROVES NOTHING !!



EVIDENCE TRAP

Evidence to Satisfy
the Skeptic



Chesapeake Bay Bridge Tunnel



York River



Mobjack



East River



Put in Creek



WHAT'S LOCAL GOVERNMENTS ROLE?

- 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.....

“PUBLIC HEALTH SAFTEY & WELFARE PROVISION”



YEAR 1: IDENTIFICATION AND ASSESSMENT OF IMPACTS

Part I

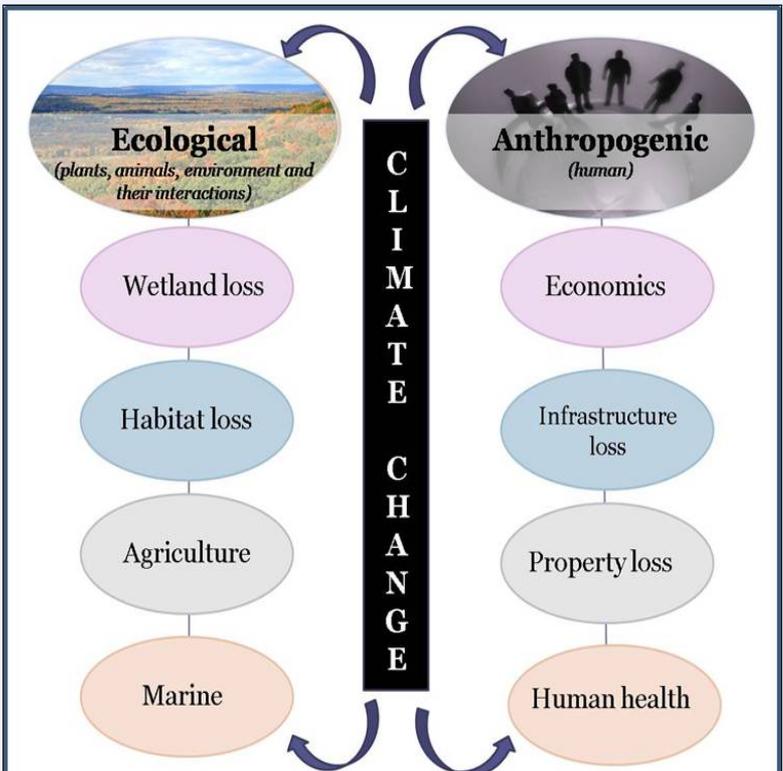


Figure 1: Climate change will ultimately impact both ecological and anthropogenic dynamics.

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.

2009
Total Long term Costs of Selected Areas in the Middle Peninsula
\$187,005,132.10 – \$249,451,074.50

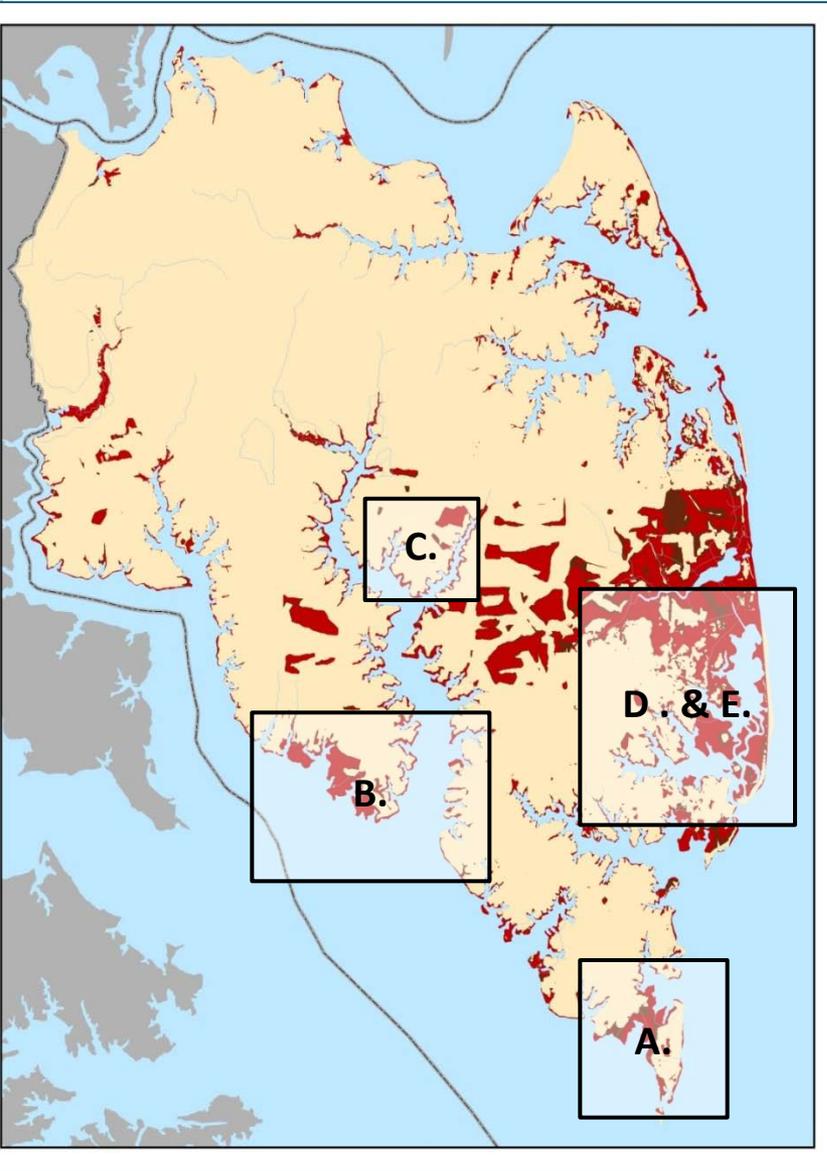
Assessment Cover Page



MATHEWS COUNTY

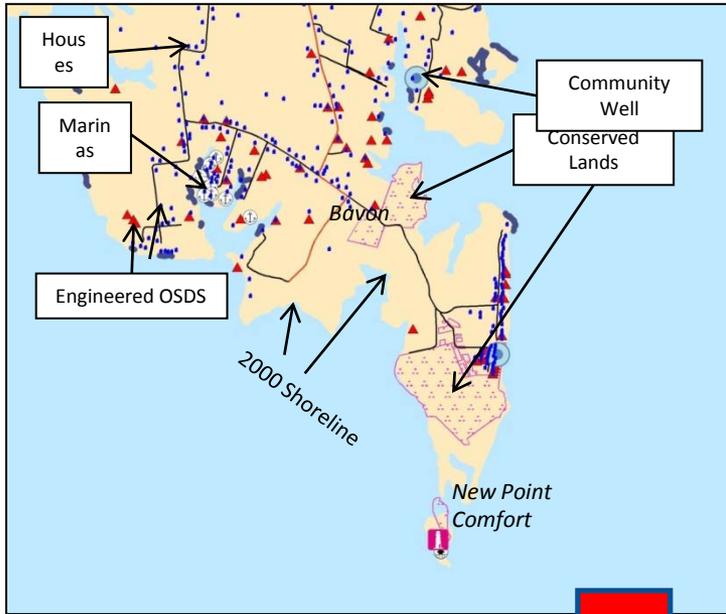
- A. New Point Comfort
- B. Bohannon
- C. Retz
- D. Onemo and Diggs
- E. Onemo and Diggs –
Ecological impacts

★ Items to focus on.

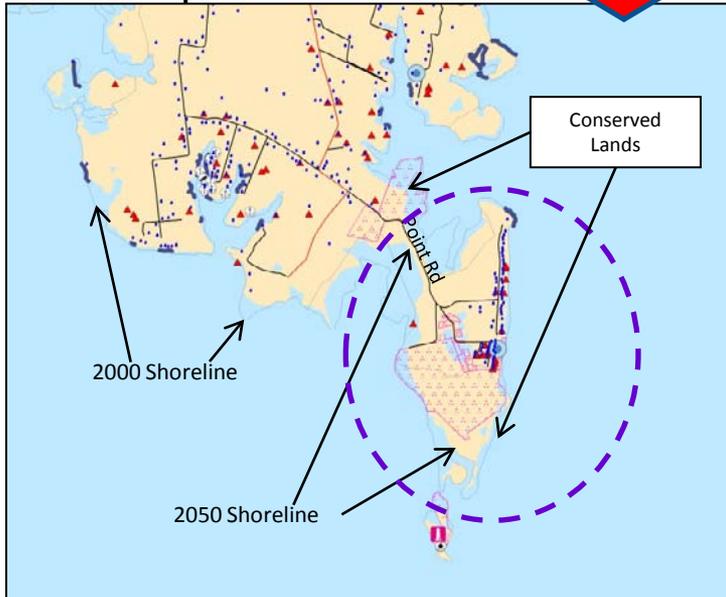


New Point Comfort: If Point Road floods consider the amount of infrastructure impacted

2000 Current



2050 Impact



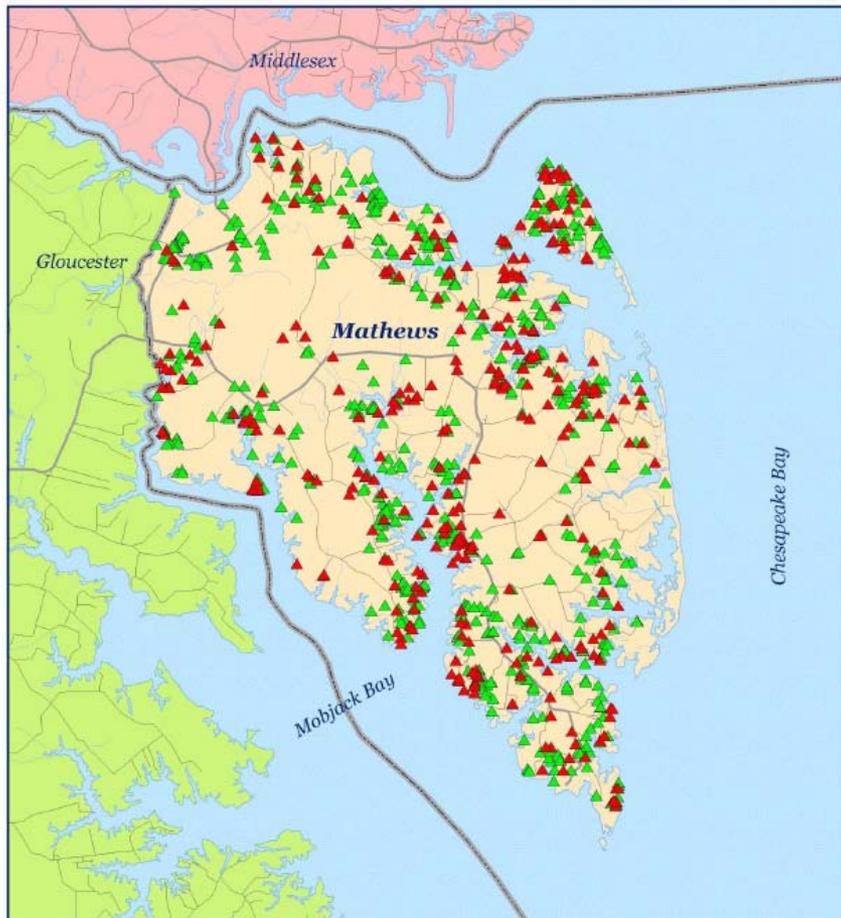
Infrastructure	Amount of Structures Impacted	Average Cost	Total Cost
Houses	72	\$228,669 Estimated median house or condo value in 2007 (City-Data.com)	\$16,464,168
Engineered OSDS	20	\$18,000 (MPPDC Regional Estimate)	\$360,000
Conventional OSDS	52	\$4,000 (MPPDC Regional Estimate)	\$208,000
Community 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?

SIGNIFICANT PRIVATE SECTOR INVESTMENT IN OSDS TECHNOLOGY

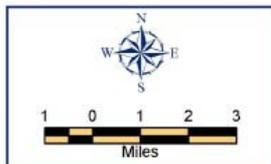
**Mathews County Engineered Septic Systems 2000-2008
(Installed and Potential)**



Legend

- ▲ Installed Systems - 331
(Cert Letters, Current Permits, Expired Permits)
- ▲ Potential Systems - 723

TOTAL # OF POSSIBLE ENG. SYSTEMS: 1054
* Data collected thru Dec. 31, 2008

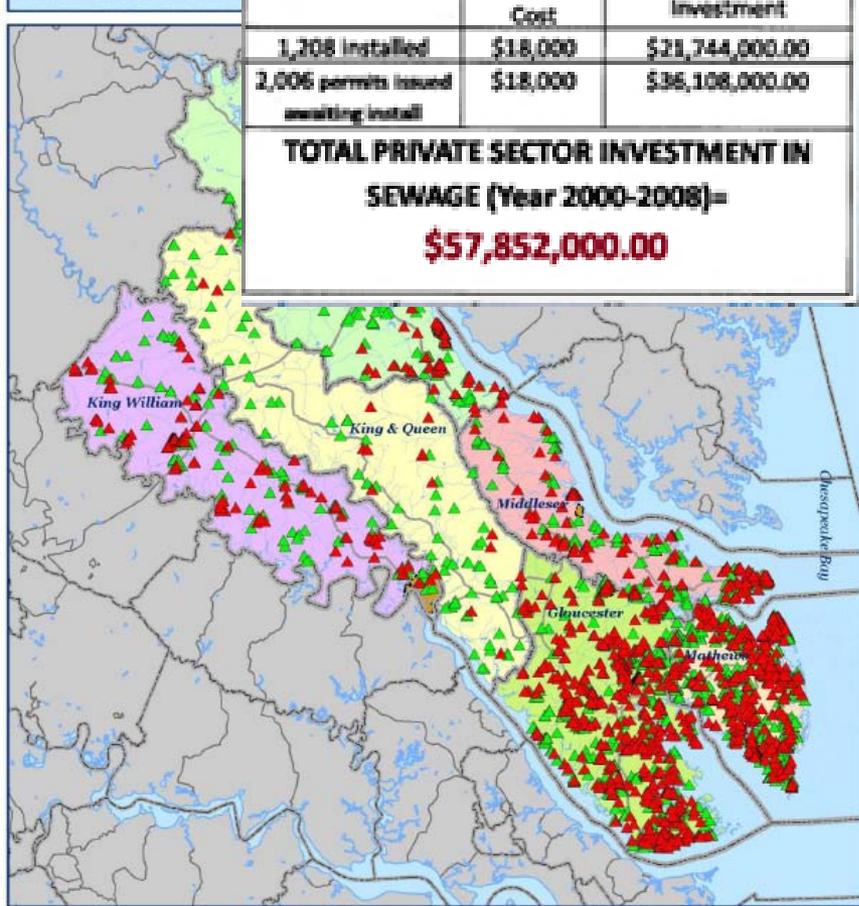


Virginia Coastal Zone

Middle Peninsula Engineered OSDs

Engineered OSDs	Average Cost	MP Private Investment
1,208 installed	\$18,000	\$21,744,000.00
2,006 permits issued awaiting install	\$18,000	\$36,108,000.00

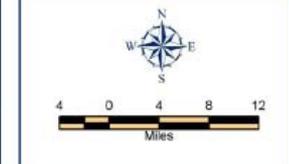
**TOTAL PRIVATE SECTOR INVESTMENT IN SEWAGE (Year 2000-2008)=
\$57,852,000.00**



Legend

- ▲ Installed Systems - 1,208
- ▲ Potential Systems - 2,006
(Cert Letters, Current Permits, Expired Permits)

TOTAL # OF POSSIBLE ENG. SYSTEMS: 3,214
* Data collected thru Dec 31, 2008



Virginia Coastal Zone





- Raise $\frac{1}{2}$ 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 = $\frac{1}{2}$ 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)



2000 Current – Ecological



2050 Impact – Ecological Loss



Onemo and Diggs: Inundated wetlands will result in fish, reptile, bird, and wildlife habitat impact and loss

Quantitative Estimates of Lost Wetland Functions			
Wetland Functions	Value (1996\$) (\$/acre/year)	Estimated loss of wetland acreage	Direct/Indirect/Induced Value of wetland Lose (\$/year)
Commercial Factors			
<i>Fishing and Shellfish Habitat</i>	\$48 ^a	954.77	\$45,828.96
<i>Waterfowl Habitat</i>	\$253 ^b	954.77	\$241,556.81
<i>Mammal and Reptile</i>	\$18 ^c	954.77	\$17,185.86
Damage Control Factors			
<i>Environmental Projection against erosion, wind, storms and flooding</i>	\$289.67 ^d – \$8,566.67 ^d	954.77	\$276,568.23 - \$8,179,199.52
Recreational Opportunities			
<i>Consumptive (ie. fishing, timbering, etc) and Non Consumptive (ie. bird watching, sight seeing) uses</i>	\$9 ^e - \$115 ^e	954.77	\$8,592.93 - \$109,798.55
Total value lost or redistributed: \$589,732.79 - \$8,593,569.70			
Qualitative Losses from Wetland Inundation			
-flood control and mitigation -fish and wildlife habitat -nursery area for wildlife -biodiversity		-water quality (ie. assimilation of waste and pollutants) -coastal erosion prevention -altering aesthetics of River and Bay vista -waterfowl habitat loss may impact bird watching	
<small>^aBell, 1989 ^bGuta and Foster, 1975 ^cFarber and Costanza, 1987 ^dGupta and Foster, 1975 and Thibodeau and Ostro, 1981 ^eFarber and Costanza, 1987 ^fBell, 1989</small>			

Conserved Lands Impacted	
Bethel Beach Natural Area Preserve	Quantitative: 63.31 acres of terrestrial land converts to subaqueous land due to inundation Qualitative: -Public access and enjoyment of to terrestrial conserved land will be limited -Habitat loss will impact the globally rare northeastern beach tiger beetle and beach plant as well as colonial nesting birds

Total Economic Impact of Selected Areas within the Middle Peninsula

Anthropogenic		Ecological
Short term	Long term	
\$126,230,366	\$185,765,366	\$4,239,764 – \$63,685,680

Total Short term Costs of Selected Areas in the Middle Peninsula

\$157,470,131.60 – \$211,916,046.90

Total Long term Costs of Selected Areas in the Middle Peninsula

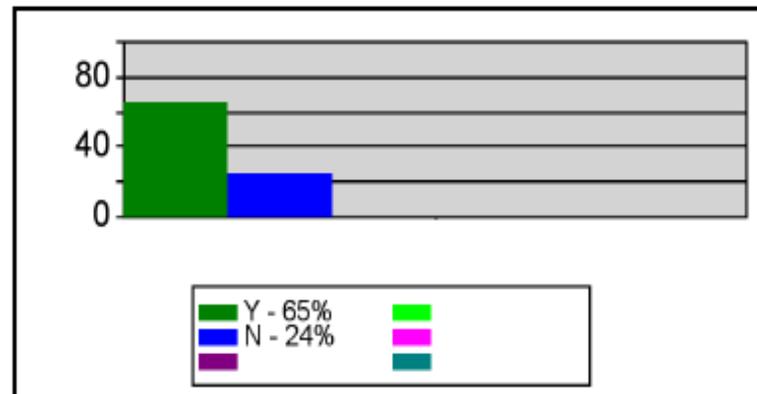
\$187,005,132.10 – \$249,451,074.50

YEAR 2: EDUCATIONAL INITIATIVE

Audience - General Public and Local Elected Officials

Approach - Gathering regional stakeholder perceptions through the use of Qwizdom Software

Focus - Climate Change, sea level rise, and what the role of local government in managing the impacts





YEAR 3:

INITIATING ADAPTATION PUBLIC POLICY DEVELOPMENT

“START” kit: Start Adaptation and Response Today

- (1) localized scientific data
 - (2) Kaiser- Permanente Natural Hazard Vulnerability Assessment Tool results for the Middle Peninsula,
 - (3) local, state, national and international case studies;
and
 - (4) sample ordinances from communities (nationwide and internationally) that have adopted adaptation policies.
- 

QUESTIONS?

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Virginia Coastal Zone
MANAGEMENT PROGRAM



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