Findings from the 2016 Calvert County Environmental Summit

Organized and Hosted
by the Calvert County Environmental Commission
on November 18, 2016

Bernie Fowler Laboratory
Chesapeake Biological Laboratory
Solomons, MD

August 2017

Findings from the 2016 Calvert County Environmental Summit

at the Bernie Fowler Laboratory, Chesapeake Biological Laboratory
University of Maryland Center for Environmental Science
November 18, 2016

Organized and Hosted by the Calvert County Environmental Commission

Environmental Summit Steering Committee

Holly Budd
Ron Klauda (Co-Chair)
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August 2017

Disclaimer:

Summit invitees and participants were asked by the Steering Committee to respond to two online surveys and also address several questions on three environmental topics during break-out group discussions. As expected, we received a wide range of responses, comments, and opinions. They are included in this findings report, but do not necessarily reflect the views of the Environmental Commission.

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Executive Summary

Concern for the protection and preservation of Calvert County's abundant yet vulnerable natural resources is front and center for many residents. That message came through loud and clear on November 18, 2016, when an important, perhaps the first of its kind or at least the first in a long time, event took place–an Environmental Summit. **Representatives from 30 environmental organizations/agencies (Appendix A) with combined memberships of over 3,000, plus other county residents, were invited to the Summit.**

About 40 people gathered in the Bernie Fowler Building at the University of Maryland's Chesapeake Biological Laboratory in Solomons to share information, insights, and experiences on a range of important environmental issues. Sponsored by the Calvert County Environmental Commission (EC), a major reason for the Summit is the CALVERT 2040 campaign underway to update the current Comprehensive Plan and rewrite the Zoning Ordinance. Summit participants shared information with the EC by responding to an online pre-Summit survey, addressing questions on three environmental topics during break-out group sessions, responding to an online post-Summit survey, and sending feedback to the EC after the Summit.

In the **pre-Summit survey** (Section II), respondents were asked which environmental issues from a list of 23 should be addressed in the updated Comprehensive Plan. The top five ranked issues were protection of tidal and non-tidal waters, wetland preservation, groundwater quantity and quality, forest preservation and connectivity, and runoff from impervious surfaces (e.g., pavement). All 23 listed issues were consistently recommended for inclusion, and survey respondents also recommended that development/population growth and economics (e.g., dollar values of natural resources and ecosystem services) were of high importance for inclusion in the updated Comprehensive Plan. **When asked if they thought the county's environment had degraded, stayed about the same, or improved, most respondents said the environment had degraded, regardless of how long they've lived in the county**. Population growth, conversion of farmland and forests to development, and more traffic were the major reasons offered for environmental degradation. On a more positive note, the opening of new county parks, more protection of watersheds, efforts to concentrate development in Town Centers, and reintroduction of wild turkeys were mentioned as observed improvements to the environment.

Break-out group sessions were used during the Summit to discuss three environmental topics that were highly ranked by the pre-Summit survey respondents. A range of opinions and suggestions were expressed by Summit participants.

1. **Future growth and development in Calvert County** (Section III-B): The EC heard that growth should occur no faster than the infrastructure can accommodate and minimize forest loss and development of large (>50 acres) contiguous tracts. Participants want to protect all areas outside of current Town Centers, especially the Critical Zone adjacent to Chesapeake Bay and riparian buffers along tributaries that drain the county landscape.

   Summit participants want to see: a) increased Rural Legacy and land preservation programs; b) more public transportation to reduce traffic volume; and c) more renewable energy

   Summit participants do not want to see: a) more retail stores and low salary businesses;

b) fracking; c) development on steep slopes or erodible soils; and d) excessive tree removal and surface grading

2. **Groundwater quality and quantity in Calvert County** (Section III-C): Summit participants expressed concerns that over pumping and draw down by industry (Dominion Cove Point in Calvert County and Chalk Point power plant in Prince George's County), impervious surfaces in ground water recharge areas, salt water intrusion, and stormwater runoff are major threats to ground water quality and quantity in Calvert County.

Additional concerns: a) discoloration, scaling, particles in groundwater water currently; b) high sulfur and arsenic; c) high rates of breast cancer and bladder cancer in Calvert County; and d) future possibility of fracking

Resolutions: a) short and long term groundwater plans in the Comprehensive Plan; b) conservation and pollutant protection measures to safeguard existing groundwater supplies; c) change regulations to allow gray water reuse d) collection of rainwater for lawns and gardens; and e) increase education and outreach to county residents on how to conserve and protect groundwater supplies

3. **Wetlands and other surface waters** (Section III-D)

During the break-out session focused on the protection of wetlands and other surface waters, including the effects of sea level rise, participants had many suggestions for actions that should be taken to better protect these important aquatic resources in Calvert County. Several suggested actions (e.g., limit development on steep slopes with erodible soils and require wider stream buffers) echoed ideas expressed in the other two break-out sessions. **Participants expressed concerns that the current best management practices for erosion control at construction sites should be evaluated, both for questionable effectiveness and also because the black mesh silt fences being used break down and add microplastic particle/fiber pollution to stormwater runoff.** We also heard that more public education is needed on what critical areas are, where they are located in the county, and how wide they should be to adequately protect wetlands and other surface waters. **Regarding the effects of sea level rise on surface waters, we heard that the county's adaptation plans should extend out for 100 years**.

Responses to the **post-Summit survey** told us that the Environmental Summit successfully achieved what we had hoped to accomplish. **All respondents rated the overall Summit experience as "Good."** Two criticisms were that the EC may have asked participants to grapple with too many ideas in the three 30 minute break-out group sessions and that some participants came to the Summit with insufficient background knowledge to adequately answer the challenging questions that were asked.

The EC received many insightful suggestions from survey respondents on forest preservation--including a desire to maintain 100% of all remaining forests in the county and requests to reinstate the Critical Area Reforestation program, require tree cover minima in Town Centers, and provide tax incentives to landowners who preserve their forest plots. **We learned that most respondents do not think stormwater is being managed effectively in the county**, and reports of observed runoff-related problems to county and state agencies were not always adequately addressed, and good suggestions for improvements were offered (Section IV). **Most**

respondents said they rely on local, state, and federal agency websites and information pamphlets to stay informed on environmental issues. **Respondents want local government agencies to prepare clearly written and understandable documents that summarize the primary environmental issues, requirements, regulations, and current statistics to help educate county residents about which agencies are responsible for which requirements and who enforces the regulations.** Almost all survey respondents said the best way to educate county residents on environmental issues, across all age groups, is via outreach booths at public events.

Additional **post-Summit feedback** received from Summit participants focused on conserving/protecting groundwater supplies in the county, gaining a better understanding of patterns of current development, and learning more about what county residents perceive as threats to their quality of life. One person recommended that more thought should be given to how environmental carrying capacity may limit land use decisions well before build-out limits are reached.

Recommendations to the Board of County Commissioners Based on Information Gleaned from the Findings of the Environmental Summit:

1. The updated Comprehensive Plan (hereafter Plan) and associated Zoning Ordinance rewrites should protect forest, wetlands, streams, and other sensitive natural areas outside of current Town Centers.
2. Forest loss should be minimized, especially in the Critical Area and riparian buffers along non-tidal tributaries that drain the county landscape.
3. Development should avoid steep slopes and areas of the county with highly erodible soils.
4. A study should be conducted to determine which State and/or county regulations or codes would need to be changed to allow reuse of gray water.
5. County residents should be encouraged to collect rainwater for non-potable uses.
6. Stormwater management practices currently being used in the county should be evaluated regularly to ensure they are effective in preventing soil erosion and sediment runoff from construction sites.
7. The county's adaptation plans for dealing with sea level rise should extend out to at least 2100.
8. County agencies should summarize environmental regulations most relevant to county residents and make this information readily available.
9. Use of renewable energy sources (e.g., solar and wind) should be encouraged in the updated Plan.
10. The Planning Commission and/or the Department of Planning & Zoning should prepare and publicize periodic reports that inform county residents on progress toward achieving the goals and benchmarks in the updated Plan.
11. Provide county residents with information on monitoring their private wells for arsenic and also how to remove it if elevated concentrations are detected[1]

[1] Maryland Department of the Environment Water Management Administration (2008, February) *Arsenic Water Treatment for Individual Wells in Maryland* Retreived from http://dhmh.maryland.gov/talbotcounty/eh/EH%20Documents/Arsenic_Treatment_in_Wells.pdf

12. County agencies/schools and the Environmental Commission should expand their efforts to educate all county residents on environmental issues at public events, at the Calvert Marine Museum, in local newspaper articles, in informational pamphlets, and on county government websites.

The Environmental Commission has already begun planning for a Second Environmental Summit in November 2017. Invitations will be extended to the environmental groups who were invited to and participated in the first Summit, to candidates for public office, as well as to members of the public. The goal of Summit Two will be to build an environmental agenda to take into the 2018 State of Maryland and Calvert County election year. Candidates for public office will be asked to state their positions on key issues contained in the agenda.

I. Introduction

A. Environmental Commission Members

1. As of 11/18/2016

Scott Sinex (Chair)
Joanne Simmons (Vice Chair)
John Barberio
Holly Budd
Ron Klauda
Jenna Luek
Carys Mitchelmore
Richard Romer
Craig Simmons
Peter Vogt
Sheila Stevens (Calvert County Public Schools Liaison)

2. As of 08/01/2017

Richard Romer (Chair)
Carys Mitchelmore (Vice Chair)
Holly Budd
William Heine
Ron Klauda
Patricia Long-Bradley
Jenna Luek
Craig Simmons
Joanne Simmons
Peter Vogt
Sheila Stevens (Calvert County Public Schools Liaison)

B. Mission

The mission of the Environmental Commission (EC) is to be the advisory board for environmental protection for the residents of Calvert County, Maryland. The EC makes recommendations to the Board of County Commissioners (BOCC) on any and all matters pertaining to the environment, including but not limited to water quality, biodiversity, sustainability, aesthetic impacts, socio-economic impacts, and the general health and welfare of county residents.

The EC decided to organize and sponsor an Environmental Summit in November 2016 to bring together representatives from all the environmental groups in the county to discuss the key environmental issues in Calvert County. The timing for the Summit was selected to coincide with the Calvert County Comprehensive Plan update and Zoning Ordinance rewrite process.

C. Summit Purpose

The EC must be knowledgeable about an array of environmental topics. In an effort to garner the information needed to make informed recommendations to the BOCC, the Planning Commission, and Calvert County's Department of Planning & Zoning (DPZ), the EC invited representatives of organizations, institutions, and agencies with an environmental focus (see list in Appendix A) to gather at the Chesapeake Biological Laboratory on the evening of November 18, 2016 to share experiences and insights on environmental issues of importance to Calvert County. The Summit was also announced to the general public through the EC website and several interested citizens attended.

DPZ launched the CALVERT 2040 campaign in late 2015 to update the current Comprehensive Plan that was adopted in 2004 and last amended in 2010, and also rewrite the county's Zoning Ordinances. As explained on the Calvert County's website (http://www.co.cal.md.us/FAQ.aspx?QID=290), "*A comprehensive plan...is the foundational policy document for local governments. It functions like a community's framework or vision for future growth to be implemented through local laws, such as zoning ordinances and subdivision regulations, and public investments over the next 20 years."* As also explained on this website, "*The Calvert County Planning Commission is responsible for the development of the comprehensive plan. Consultants from WSP/Parsons Brinckerhoff of Baltimore will assist in the development, identification of issues and preparation of the final product. Staff at the Department of Planning & Zoning will provide coordination, input, outreach and direction. The Calvert County Board of County Commissioners is granted the authority by the State of Maryland to adopt the final plan."* The current comprehensive plan is being updated now "*To ensure Calvert County's current visions are still relevant; to account for changes in demographics, economic development, job creation and retail needs; to address emerging issues like housing cost and affordability, traffic congestion and education;* [and] *to incorporate new state laws and requirements."* Updating the Plan and rewriting the Zoning Ordinances is expected to take at least two years to complete. As explained on the county's website, "*...outreach to the public* [began] *in fall 2016 and draft planning documents are expected to be ready for presentation to the public in early 2017. Extensive public input will be sought to develop the plan, and it is expected the final product will be adopted by late spring 2018."*

The EC will be reviewing and commenting on draft versions of the Comprehensive Plan updates and rewrites during 2017. Information gleaned from the Environmental Summit will be used in our comments and recommendations to CPZ staff, the Planning Commission, and the BOCC.

D. Summit Goals

The goals for the Environmental Summit that were announced to the 40 or so attendees were simple and straight forward.

1. Get to know each other better,
2. Have lively, insightful, productive, and cordial break-out group discussions,
3. Expand our knowledge of environmental issues of most importance to Calvert County, now and into the future, and
4. Provide the EC with ideas on how to move forward

The EC hoped that the Environmental Summit would yield information and ideas from invitees and assembled attendees via these sources of knowledge:

1. Answers from invitees to 10 pre-Summit survey questions,
2. Answers from attendees to questions and associated discussion in three break-out group sessions,
3. Answers from attendees to 10 post-Summit survey questions, and
4. Other unsolicited but welcome comments and recommendations from Summit attendees after the Summit.

II. What Did the Pre-Summit Survey Answers Tell Us?

The goal of the pre-summit survey was to gather and study relevant information and deliberate on all matters of the environment, including aesthetic impacts, socio-economic impacts, and the welfare of county residents. Thirty-two responses were received from representatives of 19 different environmental organizations working in Calvert County, as well as responses from seven EC members. These survey results were reported to the summit attendees and were used to select discussion topics and questions for the break-out groups during the summit. Additionally, the process of creating and distributing the summit survey allowed for the compilation of contact information and mission statements for a large number of Calvert County environmental organizations (**Appendix B**). These organizations have a range of membership numbers; half of organizations had more than 100 members, while 40% of the organizations had between 0 and 20 members (**Figure 1**).

The three selected environmental topics for break-out groups were:
1. Future growth and development
2. Groundwater quantity and quality
3. Wetland and other surface waters protection, including the effects of sea level rise

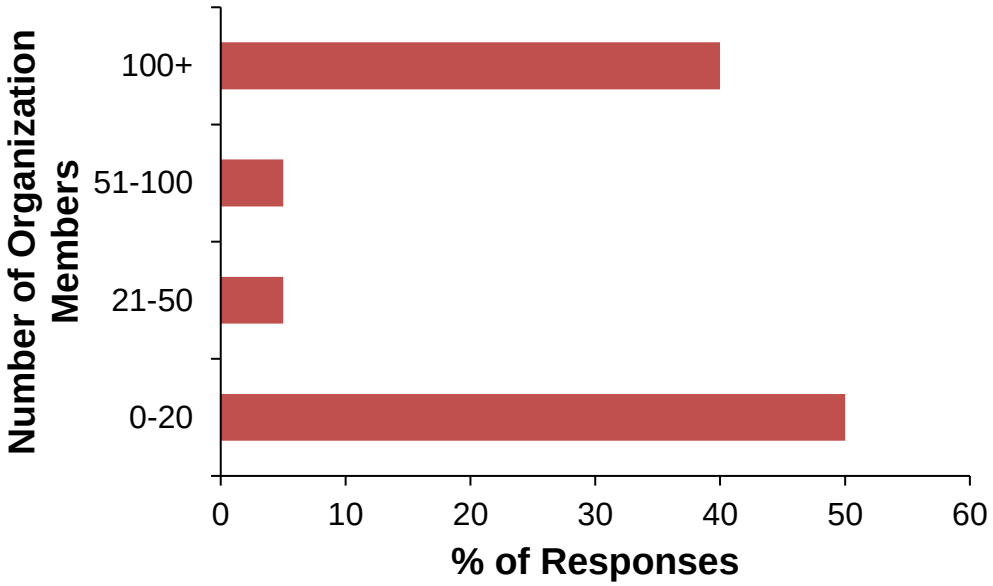

Figure 1. Distribution of organization membership responding to pre-summit survey (n=20).

Respondents were also asked to describe the area over which their organization functions. Respondents were given the choices of a) local (county level or smaller); b) state; c) regional (i.e., Chesapeake Bay); d) national; or e) global, and were permitted to select more than one response. The majority (90%) of respondents stated that their organization focused on local environmental issues, while 72% focused their efforts regionally (**Figure 2**).

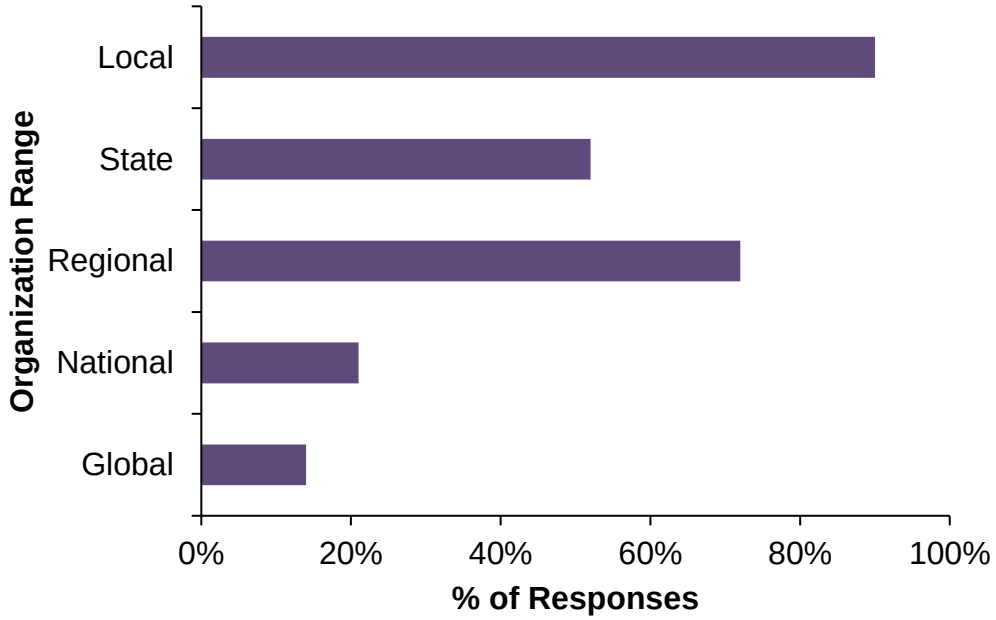

Figure 2. Geographical distribution of responding organization efforts (n=29).

Respondents were asked to state the most important environmental issues their organization works on within Calvert County (**Table 1**). Responses generally mirrored the mission statement for each organization (Appendix B), and focused on a range of topics. Environmental education was a key goal for many organizations, while land preservation and water quality were also frequently highlighted.

Table 1. Most important environmental issue individual organizations seek to address

Survey Respondents	Most important issue your organization seeks to address
Calvert County Environmental Commission	Preserve remaining farm and forestland
Maryland Saltwater Sportfishing Assoc., SOMD Chapter	Cleaning up the Bay and the rivers
University of Maryland Extension	Nutrient pollution in waterways
Citizens Climate Lobby	Support for carbon fee and dividend legislation.
Calvert County Environmental Commission	Smart growth
Calvert County Environmental Commission	The Environmental Commission is charged to be knowledgeable about all environmental issues in the county so we can provide timely and accurate recommendations to the BOCC.
Calvert Nature Society	Land preservation

Survey Respondents	Most important issue your organization seeks to address
Maryland Saltwater Sportfishing Assoc., SOMD Chapter	Water quality in Chesapeake Bay
Calvert County Natural Resources Division	Preservation of natural areas for public use and environmental benefits.
Calvert County Environmental Commission	Development
Calvert County Environmental Commission	Environmental education
Calvert County Public Schools	Environmental education of our students and public
Calvert Citizens Green Team	Consume less energy
Calvert Marine Museum	Environmental education
Calvert County Master Gardeners	Sustainable gardening in managing the landscape
Southern Maryland Audubon Society	Forest preservation
Calvert County Forestry Board	Educating the public about the cultural, economic, and environmental value of forested land.
University of Maryland Extension, 4-H	Educating public re Issues
Calvert Environmental Protection Association	Population management
Calvert Nature Society	Protection of county's natural and cultural resources
Calvert Marine Museum/Calvert County Government	Shedding light on SOMD natural and cultural history
Cove Point Natural Heritage Trust	Land preservation
American Chestnut Land Trust	Preservation and management of watersheds
Chesapeake Beach Oyster Cultivation Society	Community education regarding oyster restoration and environmental protection and biodiversity
Chesapeake Beach Oyster Cultivation Society	Environmental education
Calvert Eats Local	Local food
Patuxent Tidewater Land Trust	Protect remaining farms and forests
Morgan State University PEARL	Environmental education & economics
Morgan State University PEARL	Environmental education & economics
Calvert County Environmental Commission	Environmental preservation and quality of life

Respondents were asked whether the county's comprehensive plan update should address a set of 23 different environmental issues (yes, no, maybe, I'm not sure), and were then asked to indicate the five most important issues to their specific organization. Interestingly, only four of these 23 issues were not recommended for inclusion in the comprehensive plan update, with only one or two "no" votes each. Using a numerical scaling (yes=5, maybe =3, I'm not sure =2, no=1), the 23 issues were ranked, and the most important environmental issues to be included in the comprehensive plan update were determined (**Table 2**). Protection of tidal and non-tidal waters was the most important issue, with 100% of respondents indicating that this issue should be addressed in the comprehensive plan update. Wetland preservation, groundwater quality and quantity, forest preservation and connectivity, and impervious surfaces (e.g., pavement runoff) had more than 90% of yes votes, with one or two "maybe" votes each. The respondents indicated that four of these five topics (excluding wetland preservation) were also the issues most important to the individual organizations along with environmental education and native animal and plant life (biodiversity). Respondents indicated that a number of other issues not included in the listed topics were also important to their organization (**Table 3)**.

Based on the responses given in **Table 2 and 3**, the Environmental Commission selected a) Groundwater Quality and Quantity, b) Future Growth and Development, and c) Wetland and Other Surface Waters Protection, including the Effects of Sea Level Rise as the topics for break-out sessions held during the summit. Three additional important issues were included in the post-summit follow up survey to gather further input.

Table 2. Ranking of environmental issues to be included in comprehensive plan update (5 indicates most important to be included, 1 indicates least important to be included).

Issue	Ranking
W. Protection of tidal and non-tidal waters	5
M. Wetland preservation	4.94
A. Groundwater quantity and quality	4.88
N. Forest preservation and connectivity (forest corridors)	4.81
I. Impervious surface (e.g., pavement) runoff	4.81
B. Septic tanks	4.73
C. Cliff and shoreline erosion	4.68
O. Environmental education	4.63
S. Sea level rise and increased flooding	4.61
H. Wastewater treatment technology	4.6
K. Air quality	4.55
D. Use of pesticides and herbicides	4.53
F. Native animal and plant life -- Biodiversity	4.5
J. Non-impervious surface runoff	4.48
E. Invasive species	4.42
P. Natural environment as recreation resource	4.38
V. Traffic volume	4.35
Q. Natural environment as cultural resource	4.31
T. Non-fossil fuel energy sources	4.23
L. Atmospheric deposition of pollutants such as NOx	4.16
R. Public transportation	4.03
U. Carbon footprint	3.84
G. Mosquitoes and other disease vectors	3.71

Table 3. List of environmental issues important to responding organization not listed in **Table 2**.

Environmental Issue	
Economics	**Energy**
Economic value of natural resources	Energy conservation
Incentives to residents/businesses to do these things	Legislation for carbon fee and dividend
Value of ecosystem services	Reduction of energy consumption
Commercial value of fisheries	
Local farmers, self-sufficiency and food	**Recycling and Waste Reduction**
	Recycling programs
Development	Recycling and reuse (waste reduction)
Long-term sustainable infrastructure financing	
Development of town centers	**Other**
Smart growth	Land use
Population growth	Preservation of agricultural lands
Urban infill to prevent sprawl	Rising temperature
	Human health and nutrition and youth development
Chesapeake Bay	Restoration of degraded habitats
Quality of water in Chesapeake Bay	Public education
Dead zone	WIPs and TMDLs
Sustainability of the bay and it's fisheries	Sustainability and self-sufficiency
Bay water quality	Sediment runoff into streams

Organizations were asked if they have been involved in the current revision or previous revisions of Calvert County comprehensive plans. Less than half of respondents had been involved in the current comprehensive plan update process or the 2010 amendments to the comprehensive plan. Most respondents were unaware or assumed their organization was not involved in the adoption of the current plan in 2004.

Respondents were asked how long they had resided in Calvert County and if they thought that the natural environment in the county had improved or degraded or was about the same as when they moved into the county. If they thought it had changed, they were asked what has changed most (**Table 4**). Most respondents, regardless of time in the county, indicated that they had observed degradation of the environment during their residency in Calvert County. Population increases, more traffic, and conversion of farm and forest land to suburbs were cited most frequently as the observed changes. Some respondents cited individual improvements as well, notably improvements in land preservation and watershed protection, development within Town Centers, and the reintroduction of wild turkey were all mentioned as improvements.

Table 4. Changes in Calvert County environment during residency of individual respondents.

Years as Calvert resident	Degraded or improved environment?	Specific changes from respondents
12	Degraded	Population density, traffic
3	Degraded	Light pollution and construction, traffic increase at Cove Point
35	Prior to the institution of Town Centers and even to lesser extent now, the most visible changes in the county's landscape are the losses of forests and farmland to housing developments----changes that degraded terrestrial habitats and probably also degraded downslope aquatic resources.	Until the development of Town Centers, loss of forests and farmland to development was the most visible change. In addition, there has been a huge increase in traffic volume on county roadways since 1981, a change that is likely to be affecting the natural environment, and also having negative psychological, sociological and economic impacts.
55	Degraded	Housing
20	Both improved and degraded	Controlled growth and degraded water quality in the Bay
20	Degraded	Loss of forests and meadows to development
14	Not improved	More growth
12	Degraded	Development
37	Degraded	Amount of impervious surfaces
22	Degraded but not too severely. We have also made important strides in land preservation and watershed protection.	Route 4 congestion and traffic
13	Degraded somewhat	Increase in housing development, causing increase in volume of traffic

Years as Calvert resident	Degraded or improved environment?	Specific changes from respondents
3	I think it has stayed mostly the same in the short time that I have lived in Calvert County.	
5	Degraded	Dominion construction, woodlands turned suburbs
Not given	Degraded forests, wetlands & groundwater conservation	Traffic
20	Degraded	Traffic, impervious surface
5	About the same - some gains, some losses	Added transmission lines/corridor; LNG plant
17	Degraded	Traffic
63	Degraded natural environment	Loss of farmland and degradation of streams
16	Degraded	Cliff erosions
63	Degraded	Chesapeake Bay
46	Improved: wild turkey reintroduced. Degraded: Tidal water quality down. Loss of open spaces, per capita carbon footprint	Agricultural and forested open space developed into subdivisions
20	Degraded	Increased runoff and pollution in the bay and waterways brought about by population increases. More buildings, roads, paved areas, increased use of fertilizers and pesticides by homeowners
29	Degraded	More traffic, construction, loss of habitat, erosion
18	Degraded	Traffic and population increase
30	Degraded	Population
35	Degraded however new parks and ACLT land preservation are positive	Traffic and growth, less farms and woodland, too much development

III. What Did We Learn from the Break-out Group Sessions?

A. Overview of Break-out Group Sessions

Following the Environmental Summit's Opening Session, the attendees were divided into three groups. The break-out groups remained in their designated work spaces for all three sessions, while the session facilitators and note takers, all members of the Environmental Commission, moved from group to group for 30 minute discussion sessions with each. The membership of each group was decided by the Summit Steering Committee in advance, which resulted in a comprehensive and diverse makeup. If a participating organization sent more than one representative to the Summit, they were distributed among the three break-out groups to provide diversity among the groups while avoiding any specific viewpoint from dominating the discussions and answers to the questions. Each group session began with the participants introducing themselves and the organization they represented.

B. Future Growth and Development

The Future Growth and Development session was facilitated by Richard Romer with Ron Klauda serving as note taker. Each of the three groups quickly developed and demonstrated its own personality. The leading responses are summarized for each question as well as additional views.

i. Questions

The Future Growth and Development session asked:

1. What are the most important areas in Calvert County to protect from population growth and development?
2. Where and how does growth occur in Calvert County?
3. How should Calvert County balance future growth as a commuter community with its own stable economy?
4. What regulations should be issued to promote sustainable growth?

ii. Findings

Most important areas to protect during population growth and development:

1. Chesapeake Bay and tributaries to protect oysters
2. Using TMDLs
3. Watersheds
4. Minimize forest loss
5. Protect all areas outside of Town Centers

Calvert County growth recommendations:

1. Use more renewable energy/shift toward more solar and wind power
2. In the county's updated Comprehensive Plan, focus development where the infrastructure to support it already exists

Ideas for balancing future growth:

1. Diversify commercial development beyond retail stores and locate in town centers
2. Place a dollar value on preserving farmland and grow high quality crops

Regulations to promote sustainable growth:

1. Limit the amount of permitted tree removal and land surface grading
2. Cluster residential development and leave wooded areas intact
3. New development must be supported by new infrastructure
4. Use Rural Legacy and other land preservation programs to increase the acreage of protected land
5. The approval process for new development should not allow adverse environmental impacts

Additional views expressed at this time:

1. Increase the time scale for land use decisions and land preservation from 2040 to 2100, or longer
2. Comply with adequate public facilities ordinances
3. More clustered development is needed
4. More public transportation is needed to reduce traffic volume
5. Protect the Critical Zone from development
6. Protect groundwater aquifers
7. Control stormwater runoff
8. Stay out of riparian areas
9. Protect large (>50 acres) tracts of contiguous forests
10. Avoid steep slopes and highly erodible areas
11. Encourage more usage of renewable energy sources in the updated Comprehensive Plan

C. Groundwater quality and quantity

The groundwater quality and quantity session was facilitated by Holly Budd and John Barberio.

i. Questions

The Groundwater Quantity and Quality session asked:

1. Have you had any problems with either the quantity or quality of your well water? If so, please tell us what the problems were and what was done to fix them.
2. What do you think are the major threats to groundwater levels in the county?
3. What do you think are the major threats to groundwater quality?
4. In the face of future population growth and development in Calvert County, what water conservation and pollutant protection measures do you think should be employed to better protect our groundwater supplies?
5. Additional concerns or comments?

ii. Findings

Problems of water quality and quantity that the participants have experienced:

1. Different types of wells have their unique problems
2. Yellow, brown, and cloudy water
3. Scaling and particles
4. Naturally occurring Sulfur and Arsenic
5. Carcinogenic? - Calvert County has highest rate of Breast Cancer in Maryland (from cancer.gov)
6. EPA has lowered quality limits
7. Salt Water Intrusion
8. Drugs in water
9. Bad pipes

Major threats to groundwater levels in the county:

1. Over Pumping and drawdown by industry
2. Over Pumping – growth
3. Other Counties – impervious services in recharge areas
4. No Water Plan for short term and long term

Major threats to groundwater quality:

1. Over pumping – salt intrusion
2. Stormwater Management
3. Fracking[1]
4. Water to become valuable resource in the future
5. Runoff

Water conservation and pollutant protection measures that should be employed, to better protect our groundwater supplies:

1. Ground Water Reuse
    a. Sewage Treatment effluent is good enough to drink
    b. Use rain water
    c. Use bay water for industrial – salinity will be an issue
    d. We will have to pay more for water one way or another.
    e. We don't need to flush drinking water down the toilet.
    f. Change regulations to allow for gray water (code should be checked)
    g. Water Recovery Systems
    h. Sewage and stormwater management
2. Water Efficient through technology, devices and infrastructure
    a. Building Codes – LEED communities
    b. Filter Systems (i.e., to remove arsenic for private wells)
    c. County should work with realtors and developers
    d. Rain Gardens
    e. Lawn Management Save Water (basins, rain barrels, rock gardens)

[1]Governor Hogan signed legislation to ban fracking in Maryland when an the temporary ban expires October 1, 2017

3. Incentive for Homeowners to reduce water use
    a. Eliminate fertilizers
    b. Restrict water use
    c. Tankless water heater to reduce wasting water waiting for it to get hot
    d. Give up the lawn
4. Education/Culture to save water
    a. Chespax
    b. Green teams
    c. Save water: basins, rain barrels, rock gardens, rain gardens
    d. Lawn management

iii. Additional concerns or comments about groundwater issues in Calvert County

1. How do we prepare for the 60+ hotter days projected in 2050?
2. Development and fracking are common concerns.
3. Oysters

iv. Conclusions

The participants had experience with and were knowledgeable about the science behind the groundwater issues facing Calvert County. They had several suggestions for water conservation and pollutant protection measures that should be employed, to better protect our groundwater supplies.

D. Wetland and other surface waters protection, including the effects of sea level rise

The wetland and other surface waters protection session, including the effects of sea level rise session was facilitated by Carys Mitchelmore and Scott Sinex.

i. Questions

The wetland and other surface waters protection group session asked:

1. Are you aware of any environmental problems in a wetland or other surface waters in Calvert County, particularly on or near your property or workplace? If so, please tell us what you saw or heard. What do you think are the major threats to groundwater levels in the county?
2. What do you think are the leading sources of surface water pollutants?
3. What are some actions that should be taken to eliminate or reduce the introduction of these pollutants into our surface waters, and what remediation programs should be implemented to fix the problems we now have with aquatic habitat quality?
4. How can we develop infrastructure systems to help reduce wetland losses in the county due to sea level rise?

ii. Findings

Problems of wetland and/or surface water quality and problems that the participants have experienced:

1. Stormwater runoff with associated pollutants and erosion caused by stormwater runoff (and hence sediment pollution)
2. Erosion of shorelines/wetlands from boats and wakes
3. Spring discharges from boaters
4. Raw sewage dumping – algal bloom problems
5. Oil/antifreeze/lawn chemicals run-off
6. Developments and sediment control or lack thereof (and degradation of breakdown of black mesh)
7. Sediment ponds and filling

Major sources of surface water pollutants in the county:

1. Lawn fertilizers
2. Runoff from highways with car emissions (public transportation lacking), oil
3. WWTP (waste-water treatment plant effluent and biosolid land application)
4. Power plants
5. Chemical control of invasive vegetation
6. Oil slicks
7. Septic systems failing
8. Nitrogen from septic tanks in general
9. Agricultural runoff especially animal waste
10. Residential burn barrels
11. Other residential sources
12. Pharmaceutical waste – household
13. Oil/paint

Actions and protection measures that should be employed to better protect our wetlands and surface waters:

1. Capture runoff – rain barrels, bioswales (Chesapeake Bay Trust grants for organizations)
2. Better stormwater management and stormwater treatment
3. Watershed steward programs
4. Integrated pest management approaches
5. Maintain forest buffers especially adjacent to development
6. More buffers on streams (increase width / size of these)
7. Limit development on steep slopes
8. Nutrient management plans
9. Critical area education (i.e. public education on what these are and how large they need to be).
10. Better run-off protection in development sites (i.e. barriers can lead to microplastic/fibers pollution)

Suggestions on how to develop future infrastructure to help minimize wetland losses in Calvert County included:

1. How do you step-back as sea level rises? (allow for the migration of wetlands, alter land-use and zones to allow for this, help restoration activities to do this)
2. Consider problems of groundwater usage as subsidence of land occurs due to this extraction
3. Retreat homes and properties away from the water's edge (and what is projected for the next 100 years)
4. Plan for 100 year horizontal sea level change and consider models
5. Best practice stormwater management – catch and hold (consider larger storm events)
6. Ensure smart growth in Calvert County

iii. Additional concerns or comments about groundwater issues in Calvert County

1. Produce a list of environmental organizations in Calvert County and what they do.
2. Put signs up in Drum Point (and other beach communities) notifying public of bacterial contaminants and pollutants.
3. Consideration of soil type i.e., if there is a very erodible soil in headwater streams
4. Participants had questions on what are the Cove Point LNG sewage connections and extent of air pollution (which may end up in the water); what are the inputs (chemical types and quantity), how will this be monitored?
5. Participants also wanted to know what are the best practices for stormwater management and are they checked periodically, and if so how often?

iv. Conclusions

The participants had various levels of personal experience with and knowledge about the science behind surface water pollution and impacts of water quality and environmental impacts on wetlands in Calvert County. There were many suggestions and ideas for pollutant protection measures that should be employed, to better protect our wetlands and surface water supplies. In addition, they suggested the need for public education on buffer zones in properties close to waterways and further suggested that these set-backs are not wide enough and should be increased to prevent run-off from properties, especially with lawn chemicals, etc. They also suggested the best management practice (BMP) for sediment control should be re-looked at, first as many seem to be ineffective and second that there is current science suggesting that these barriers break down and add to microplastic/fibers pollution in run-off water and ultimately into the streams and rivers.

IV. What Did the Post-Summit Survey Answers Tell Us?

A. Overview of Post-Summit Survey

A post-summit survey was distributed to attendees to determine the effectiveness of the meeting and obtain their views on three environmental issues that were not discussed at the summit due to time constraints. All questions also allowed for open-ended comments, so some are added as part of the discussion below while the remainder can be found in Appendix C along with all questions and responses. A total of nine individuals of the ~40 summit attendees responded to this survey compared to 32 who responded to the pre-summit survey.

The three selected environmental topics for follow-up questions were:
1. Forest preservation and connectivity (e.g, corridors),
2. Managing stormwater runoff from farmland, suburban, and urban landscapes, and
3. Public education/outreach on environmental issues.

B. Comments on Summit

Attendees were first asked about EC familiarity prior to contact from Summit organizer Ron Klauda. Of the eight responses to this question, three knew "A lot", four knew "A little", and one knew "Almost Nothing." Simply organizing the summit allowed for more people to gain knowledge about the Environmental Commission. All respondents rated the Summit overall as "Good," rather than "Fair" or "Poor". Respondents were also asked to rate the three individual break-out groups. All respondents indicated that both the future growth and development session and wetland and surface waters session were "Good". The groundwater quality and quantity session was rated less favorably, with half of respondents rating that session as "Fair", and the other half as "Good". Seven individuals said they were able to express their views during the break-out sessions, while one individual said they were only able to express some of their views. In commenting on the break-out sessions, three critiques were raised: 1) initial confusion and a lot of ideas put forth, 2) insufficient time available for discussion, and 3) insufficient information to respond adequately to questions. In this third critique, the individual said their expectation was to learn and fill their knowledge gap during the summit, and felt it challenging to answer the posed questions with this knowledge gap.

C. Comments on Topics

1. Forest preservation and connectivity

Summit attendees were asked if they thought existing regulations and incentives at the state and county levels are sufficient to maintain forest preservation and connectivity within Calvert County. Responses ranged from no (3 responses) to yes (2 response). One individual said that they would like to see 100% of forest maintained. Another said that the regulations are relatively good but that development always trumps corridor preservation, and that minimum lot size in the critical area has been paramount in protecting buffer zones and private forest. Individuals were asked how the Comprehensive Plan update could promote increased forest preservation and connectivity. Responses are shown in **Table 5**.

Table 5. Methods to promote increased forest preservation and connectivity

1	More outreach: participate in programs and get a free bird house, bat house, mason bee house, or other ways to attract wildlife
2	More agriculture and forest preservation programs for smaller land owners, 10 or less acres
3	Don't know if it's necessary, must balance between growth in the county and preservation
4	Increase acres in preservation
5	Reinstate the Critical Area Reforestation program. Require developers to leave stands of trees. Require strip malls to leave trees between the mall and roadway, or plant native trees if none exist.
6	Ensure tree cover minimums in each town center. Prioritize forest preservation for purposes of water quality, air quality, quality of life, wildlife, etc.
7	Identify and protect hubs and corridors
8	Keep or increase forest preservation goal, and ensure benchmarks and reports are actually measured and reported.
9	More tax incentives for smaller plot owners (3-10 acres)

Respondents were asked how individual citizens can support forest preservation and connectivity efforts if they are not property owners. Respondents suggested that citizens should participate and learn about the science, issues, and efforts, be conscientious of environmental issues when voting, support forest preservation efforts such as community plantings in public areas, work with land trusts, or join the forestry board. In final comments on forest preservation and connectivity, one individual expressed the desire to have information on county and state regulations on forest preservation more readily available to the average citizen.

2. Managing stormwater runoff from farm land, suburban, and urban landscapes

Individuals were asked if they thought stormwater was being managed effectively in Calvert County. Responses included “No” (4 respondents), “Don’t know” (1 respondent), “Could be better” (1 respondent), “Poorly in most areas” (1 respondent), and “Only if regulations are enforced” (1 respondent). Respondents were asked if they have seen extensive erosion, stream sedimentation, or other serious impacts from stormwater runoff, and if they had contacted a county or state agency to report a stormwater runoff-related problem. Individuals had achieved varying degrees of success in their attempts to correct stormwater runoff-related problems. Stormwater environmental impacts have been observed in multiple places in the county: Clay Hammond Rd., Rousby Hall near Cove Drive, Appeal School, grounds of the Community

Resources Building, in streams near Prince Frederick Town Center, and in two unnamed neighborhoods. Survey respondents informed us that when they contacted county or state agency personnel or their homeowners' associations to report what they thought was a stormwater runoff-related problem; they received a range of responses and actions. In many cases, the identified issue was inspected and the problem was fixed. But in two instances, the identified runoff problems remain unresolved.

Respondents were also asked if they had seen innovative stormwater management being practiced in the county. Specifically, the holding tank at the Dares Beach roundabout and the area behind the Prince Frederick Library were mentioned as areas where individuals have observed innovative stormwater management. One individual described having to dig five stormwater pits when building their house 12 years ago, which have been effective in controlling roof runoff. One individual suggested that maintaining swales and ground cover to retain soil could be a more effective technique than the frequently used retention ponds. One respondent said that rain gardens in the county are an effective technique. Another respondent suggested that stormwater should be captured and recycled.

In other comments on stormwater runoff, several individuals said there is a serious concern for the future of the county in this area and they suggested several ways to make broad improvements. These ideas included adding incentives and educational programs for native landscaping and using rain barrels, breaking up large parking lots and working towards net zero runoff, and devising community wide runoff measures that address the community based on the topography and landscape.

3. Environmental education and awareness in Calvert County

In an attempt to understand how important environmental education is for county residents, respondents were asked both how they learn about environmental issues (**Figure 3**), as well as rank approaches for improving outreach to county residents (**Figure 4**). All individuals said they relied on local, state, and federal websites or informational pamphlets to inform themselves on environmental issues. Informal education from personal investigations, museums, and outreach were also important. Formal education and training was cited by only half of the respondents. Individuals also commented that personal observations and being outside are important, and that Master Gardeners, Chesapeake Bay Foundation, and other local organizations are important sources of information. One individual suggested that the county make more of an effort to educate its citizens by providing a summarized booklet on the primary issues, requirements and regulations, current statistics, and impact, etc., all written in laymen's terms and disseminated, so the citizens are aware of these issues.

Respondents said that environment education outreach booths at public events are one of the most effective ways to reach the largest number of county residents, followed by public meetings/presentations and newspaper articles. Exhibits, online surveys, and telephone surveys ranked the lowest.

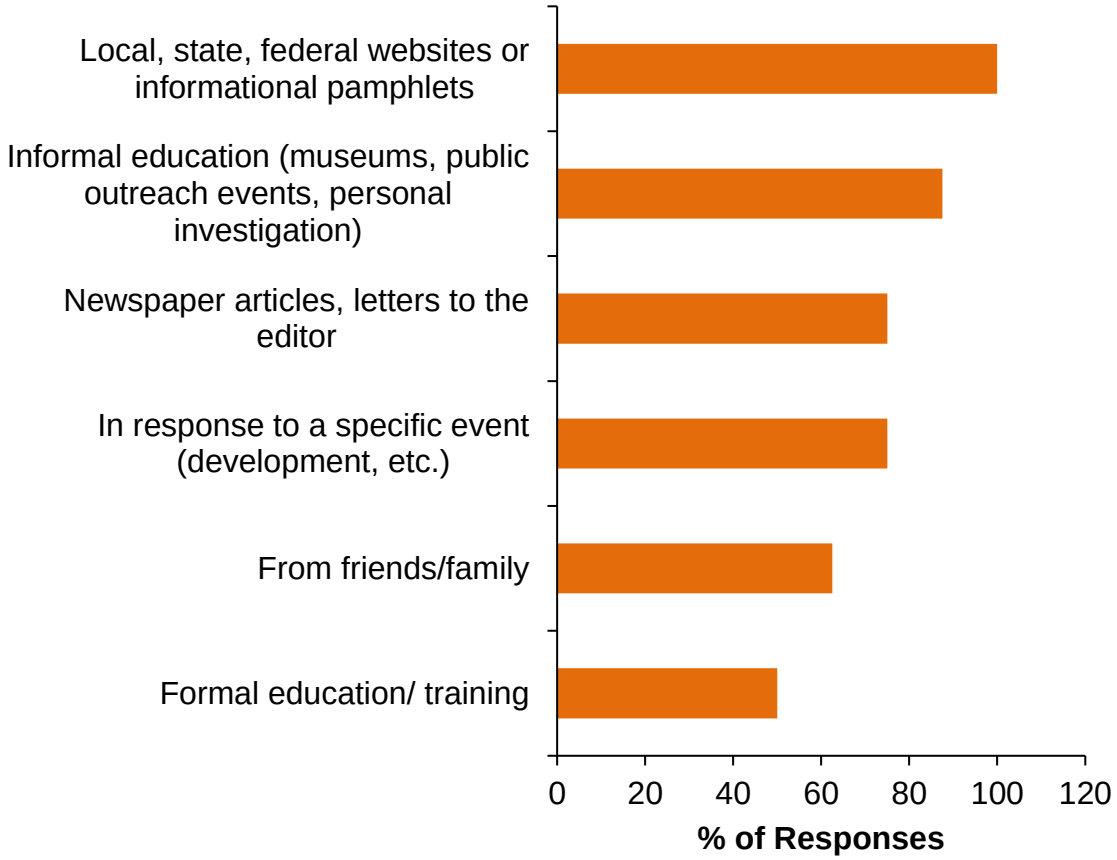

Figure 3. Sources used by respondents to educate themselves on environmental issues important in Calvert County (n=8).

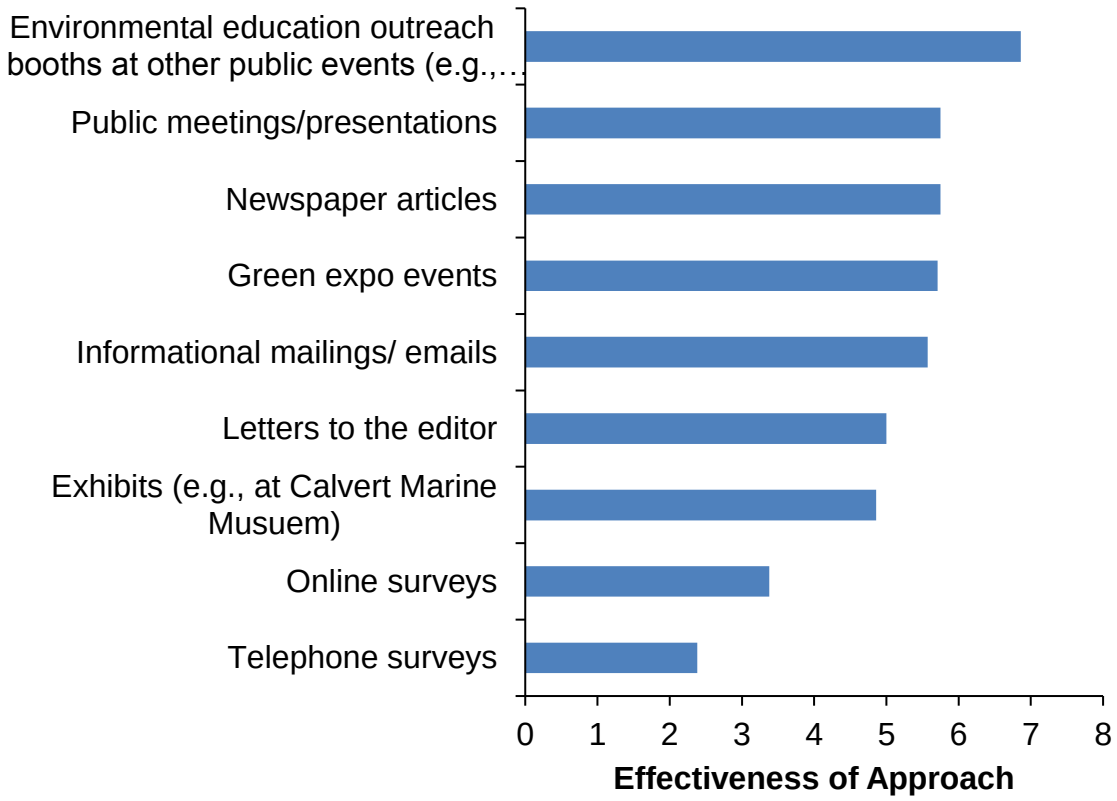

Figure 4. Respondent ranking of the effectiveness (from most to least, higher number=more effective) of environmental education approaches for reaching the most county residents across all age groups.

V. Recommendations to the Board of County Commissioners Based on Information Gleaned from the Findings of the Environmental Summit:

1. The updated Comprehensive Plan (hereafter Plan) and associated Zoning Ordinance rewrites should protect forest, wetlands, streams, and other sensitive natural areas outside of current Town Centers.
2. Forest loss should be minimized, especially in the Critical Area and riparian buffers along non-tidal tributaries that drain the county landscape.
3. Development should avoid steep slopes and areas of the county with highly erodible soils.
4. A study should be conducted to determine which state and/or county regulations or codes would need to be changed to allow reuse of gray water.
5. County residents should be encouraged to collect rainwater for non-potable uses.
6. Stormwater management practices currently being used in the county should be evaluated regularly to ensure they are effective in preventing soil erosion and sediment runoff from construction sites.
7. The county's adaptation plans for dealing with sea level rise should extend out to at least 2100.
8. County agencies should summarize environmental regulations most relevant to county residents and make this information readily available.
9. Use of renewable energy sources (e.g., solar and wind) should be encouraged in the updated Plan.
10. The Planning Commission and/or the Department of Planning & Zoning should prepare and publicize periodic reports that inform county residents on progress toward achieving the goals and benchmarks in the updated Plan.
11. County agencies/schools and the Environmental Commission should expand their efforts to educate all county residents on environmental issues at public events, at the Calvert Marine Museum, in local newspaper articles, in informational pamphlets, and on county government websites.
12. Provide county residents with information for removing arsenic from private wells[2]

[3] Maryland Department of the Environment Water Management Administration (2008, February) *Arsenic Water Treatment for Individual Wells in Maryland* Retreived from http://dhmh.maryland.gov/talbotcounty/eh/EH%20Documents/Arsenic_Treatment_in_Wells.pdf

VI. Acknowledgements

The Environmental Commission is grateful to Dr. Tom Miller, Director of the Chesapeake Biological Laboratory and Professor in the University of Maryland's Center for Environmental Science, and his staff, for providing meeting space in the Bernie Fowler Laboratory and refreshments for Summit attendees. We also thank Louise Carroll for help at the registration table.

Richard Romer, the Chairman of the Environmental Commission, gives a special thanks to Ron Klauda and Jenna Luek, a CBL Doctoral Candidate, who co-chaired the Environmental Summit Steering Committee and were primarily responsible for organizing and writing this report. During the effort, Jenna refused to let an athletic injury impede her progress. For most of the time she worked on this project, Jenna was living in Munich, Germany, analyzing data for her doctoral dissertation. She time shifted her schedule through continuous and judicious use of the internet.

VII. Appendices

Appendix A. List of Environmental Groups in Calvert County

Appendix B. Organizations Responding to Rre-Summit Survey

Appendix C. Responses from the Post-Summit Survey Results

Appendix D. Additional Summit Feedback

Appendix A. List of Environmental Organizations in Calvert County

Organizations	Mission Statements	Year Founded *	Approximate number of members*	Contact Person	Contact Email Address
American Chestnut Land Trust	To promote land conservation throughout Calvert County, To provide sustainable public access to our preserved properties, To protect the natural and cultural resources of the Parkers Creek and Governors Run watersheds.	1986	100+	Greg Bowen	gbowen@acltweb.org
Association of Southern Maryland Beekeepers	Dedicated to the free exchange of ideas, opinions, and information resources to support beekeepers in St. Mary's, Calvert, and Charles counties	1977	152	Walt Williams	williamsannwalt@md.metrocast.net
Calvert Citizens Green Team	Work to promote sustainable lifestyles by identifying and sharing innovative green technologies, hosting a Green Expo and encouraging environmental stewardship among county citizens in their homes, workplaces and communities.	2008	0-20	Dawn Balinski	balinski.dawn@gmail.com
Calvert County Department of Planning & Zoning	To maintain or improve the quality of life for county residents by providing quality planning, zoning and code enforcement services to Calvert County at the direction of the Board of County Commissioners			Mark Willis	willismj@co.cal.md.us
Calvert County Division of Solid Waste & Recycling	To provide all customers with efficient, cost effective, reliable and safe management of Calvert County's solid waste and recycling activities.			William Teter	teterwj@co.cal.md.us

Organizations	Mission Statements	Year Founded *	Approximate number of members*	Contact Person	Contact Email Address
Calvert County Environmental Commission	To make recommendations to the Board of County Commissioners of Calvert County after thorough study and deliberation concerning matters of environmental impact to the residents of Calvert County on any and all matters pertaining to the environment of said county, pertaining to, but not limited to, aesthetic impact, socio-economic impact, and the general health and welfare of the said resident	1975	11	Rich Romer	racebeat@aol.com
Calvert County Forestry Board	The Calvert Forestry Board is a group of citizens who serve as advocates for forestry in Calvert County.			Autumn Phillips	Landmanager @acltweb.org
Calvert County Health Department	To promote and protect the health of all county residents by preventing illness and eliminating hazards to health			Bill Haygood	dhmh-dl-calchd-environmentalhealthcare @maryland.gov
Calvert County Master Gardeners	To educate Maryland (Calvert County) residents about safe, effective and sustainable horticultural practices that build healthy gardens, landscapes and communities, thereby reducing fertilizer and pesticide use, and improving our soil and water quality.	2002 (Calvert) UMD (1979)	51-100	Judy Kay	http://extension.umd.edu /calvert-county/master-gardeners
Calvert County Buildings and Grounds Division	Buildings and Grounds (Part of Dept. of General Services) is responsible for the custodial care, buildings and grounds maintenance including noxious weed for active farms and repair and renovation of county-owned and leased facilities. The division provides these services to all county departments, county libraries, the Sheriff's			Tom Jones, Division Chief	jonestl@co.cal.md.us

Organizations	Mission Statements	Year Founded *	Approximate number of members*	Contact Person	Contact Email Address
	Office, court systems, community centers, etc. with its staff and contractors. Includes Mosquito Control				
Calvert County Natural Resources Division	To preserve, manage and operate natural resource areas to provide compatible outdoor recreation and educational opportunities for the public.			Karyn Molines	molinekl@co.cal.md.us
Calvert County Public Schools	Public education			Sheila Stevens	stevenssr@ calvert.net.k12.md.us
Calvert Eats Local	A citizen organization dedicated to the support of sustainable agriculture and community in Southern Maryland.	2010	100+	Holly Budd	hbudd@whmap.com
Calvert Marine Museum	Preservation of natural, maritime and geological history of Calvert County.	1975		David Moyer	moyerde@co.cal.md.us
Calvert Nature Society	Calvert Nature Society is dedicated to the protection and preservation of Calvert County's natural heritage and the creation of an environmentally literate and aware community. We provide opportunities for appreciation and understanding of our natural world through our outreach initiatives and in support of the mission of the Calvert County Natural Resources Division.	1987	100+	Anne Sundermann	anne@calvertparks.org
Chesapeake Bay Commission	To advise the general assemblies of Maryland, Pennsylvania, and Virginia on matters of Baywide concerns			Bernie Fowler	Riverman @chesapeake.net

Organizations	Mission Statements	Year Founded *	Approximate number of members*	Contact Person	Contact Email Address
Chesapeake Beach Oyster Cultivation Society	To raise 100,000 oyster spat for one year prior to planting in Chesapeake Bay; conduct educational field trips for the Calvert County School System so students can view the oyster growth cycle; monitor water quality in Fishing Creek for oyster health; offer outreach programs for civic, church and youth groups; and enhance the Chesapeake Beach Railway Trail	2010	100+	John Bacon	johnbacon1 @comcast.net
Chesapeake Environmental Protection Association	Environmental protection of bay watershed	1970	0-20	Albert Tucker	webmaster@ cepaonline.org
Chesapeake Ranch Estates Lake Preservation Committee	CRE lake preservation			Andy Rogers	andy.rogers@ rogersenvironmental.com
Citizens Climate Lobby	To create the political will for climate solutions by enabling individual breakthroughs in the exercise of personal and political power.	National Group 2007	0-20	Audrey Butler	Princefrederick @citizensclimatelobby.org.
Cove Point Natural Heritage Trust	To preserve and protect ecologically sensitive sites in the vicinity of Cove Point through land conservation, scientific research, and environmental education	1994	0-20	Bob Boxwell Mike Rudy	Bobboxwell @hotmail.com rudymr@comcast.net
Maryland Saltwater Sportfishing Assoc., SOMD Chapter	Promote the fisheries in the Bay, Bay conservation and fisheries conservation	1985	100+	Jerry Gaff	jerrygaff@yahoo.com

Organizations	Mission Statements	Year Founded *	Approximate number of members*	Contact Person	Contact Email Address
Morgan State University	The mission of the Patuxent Environmental & Aquatic Research Laboratory (PEARL) is to provide society with the knowledge to solve its environmental challenges through research, education and economic development.	2004		Kelton Clark	kelton.clark @morgan.edu
Patuxent Tidewater Land Trust	Land preservation	1996	0-20	Frank Allen	Corncribstudio @outlook.com
Sierra Club, Southern Maryland Group, Maryland Chapter	To protect the state's and county's natural wildlife resources by monitoring legislation, sponsoring outings, and educating the public about pressing environmental issues			Bob Boxwell	Bobboxwell @hotmail.com
Southern Calvert Land Trust	To preserve open space lands in southern Calvert County, to acquire land or conservation easements, to promote wise land use, and to enrich the lives of southern Calvert County residents through preservation of ecologically important open space and wetlands			Curt Larsen	larsen@msn.com sclt@hughes.net
Southern Maryland Audubon Society	To promote appreciation, conservation, and protection of birds, other wildlife, and their natural habitats through education, research, and outreach	1971	100+	Lynne Wheeler	Somdaudubon @yahoo.com

Organizations	Mission Statements	Year Founded *	Approximate number of members*	Contact Person	Contact Email Address
Sustainable Calvert Network	To share information and offer support among Network members; to achieve a future for Calvert County that fully integrates farming, fishing, natural and cultural resources along with economic and societal needs.			Greg Bowen	gbowen@acltweb.org
University of Maryland Center for Environmental Science Chesapeake Biological Laboratory	To be a research, education, and service institution of the University System of Maryland (USM) and a world leader in the science of coastal environments and their watersheds. The Center's faculty advances knowledge through scientific discovery, integration, application, and teaching that results in a comprehensive understanding of our environment and natural resources, helping to guide the State and world toward a more sustainable future.	1925		Tom Miller	miller@umces.edu
University of Maryland Extension, 4-H	Non-formal education system providing assistance to citizens in agriculture, environment & natural resources, food & nutrition, health & wellness, water & Chesapeake Bay, and home gardening	1914		Chris Seubert	cseubert@umd.edu

* Responses provided by organization representatives during November 2016 Pre-Summit Survey or available on public website

Appendix B. Organizations Responding to Pre-Summit Survey

Survey Respondents	Mission	Founding Year
American Chestnut Land Trust	To promote land conservation throughout Calvert County, To provide sustainable public access to our preserved properties, To protect the natural and cultural resources of the Parkers Creek and Governors Run watersheds.	1986
Calvert Citizens Green Team	Work to promote sustainable lifestyles by identifying and sharing innovative green technologies, hosting a Green Expo and encouraging environmental stewardship among county citizens in their homes, workplaces and communities.	2008
Calvert County Environmental Commission	To be the advisory board for environmental protection for the residents of Calvert County	1975
Calvert County Forestry Board	The Calvert Forestry Board is a group of citizens who serve as advocates for forestry in Calvert County.	
Calvert County Master Gardeners	To educate Maryland (Calvert County) residents about safe, effective and sustainable horticultural practices that build healthy gardens, landscapes and communities, thereby reducing fertilizer and pesticide use, and improving our soil and water quality.	2002 (Calvert) UMD (1979)
Calvert County Natural Resources Division	To preserve, manage and operate natural resource areas to provide compatible outdoor recreation and educational opportunities for the public.	
Calvert County Public Schools		
Calvert Eats Local	A citizen organization dedicated to the support of sustainable agriculture and community in Southern Maryland.	2010

Survey Respondents	Mission	Founding Year
Calvert Environmental Protection Association	Environmental protection of bay watershed	1970
Calvert Marine Museum	Preservation of natural, maritime and geological history of Calvert County.	1975
Calvert Nature Society	Calvert Nature Society is dedicated to the protection and preservation of Calvert County's natural heritage and the creation of an environmentally literate and aware community. We provide opportunities for appreciation and understanding of our natural world through our outreach initiatives and in support of the mission of the Calvert County Natural Resources Division.	1987
Chesapeake Beach Oyster Cultivation Society	Oyster restoration and youth education	2010
Citizens Climate Lobby	To create the political will for climate solutions by enabling individual breakthroughs in the exercise of personal and political power.	National Group 2007
Cove Point Natural Heritage Trust	Research, land protection, and environmental education	1994
Maryland Saltwater Sportfishing Assoc., SOMD Chapter	Promote the fisheries in the Bay, Bay conservation and fisheries conservation; Protect saltwater fish and rights of recreational fishermen	1985
Morgan State University-PEARL	The mission of the Patuxent Environmental & Aquatic Research Laboratory (PEARL) is to provide society with the knowledge to solve its environmental challenges through research, education and economic development.	2004
Patuxent Tidewater Land Trust	Land Preservation	1996

Survey Respondents	Mission	Founding Year
Southern Maryland Audubon Society	Education, Conservation	1971
University of Maryland Extension	University of Maryland Extension	1914
University of Maryland Extension, 4-H	To apply research and provide education in agriculture	1914

Appendix C. Additional Responses from Post-Summit Survey

Question 1. How much did you know about the Calvert County Environmental Commission, their Mission, and activities before you started receiving emails from Ron Klauda and you attended the Nov. 18 Summit?
8 responses

A. A lot (3)
B. A little (4)
C. Almost nothing (1)

Comments:
i. County Commissioners should pay more attention to their input
ii. I had attended one or two of their meetings in 2014 and had followed their attempts to comment on the Dominion Cove Point Draft EA.
iii. Replying for Calvert Eats Local and on the EC.

Question 2. Based on the information that was presented and discussed at the Nov. 18 Summit, how would you rate it overall? If you came to the Summit expecting to discuss a topic or topics that were not covered, please tell us more in the "Comments" box.
8 responses

A. Good (8)
B. Fair (0)
C. Poor (0)

Comments:
i. No expectations. Depends on outcome.
ii. I think you guys did a great job in how you approached and ran it, given the limited time available.
iii. It was also nice to learn about the participants

Question 3a. How informative and productive did you find the future growth and development Break-out Group Session to be (e.g., good, fair, poor)?
8 responses

good (8)

Question 3b. How informative and productive did you find the groundwater quality and quantity Break-out Group Session to be (e.g., good, fair, poor)?
8 responses

good (5)
fair (5)

Question 3c. How informative and productive did you find the Wetland and Other Surface Waters Protection, including the Effects of Sea Level Rise Break-out Group Session to be (e.g., good, fair, poor)?
8 responses

good (8)

Questions 3d. Rank the break-out sessions in order of usefulness to you (e.g., C> A> B where C was most useful and B was least useful)
A: future growth and development
B: groundwater quality and quantity
C: Wetland and Other Surface Waters Protection, including the Effects of Sea Level Rise
6 responses

CBA (1)
CAB (1)
ABC (2)
ACB (2)

Question 3e. Did you have an opportunity to express your views during the Break-out Group sessions?
8 responses

yes (7)
some (1)

Question 3f. Any other comments on Break-out Group Sessions?
7 responses

i. very well run and for the most part very informative
ii. Could have been more informative. Expectation was to learn. Hard to answer questions posed by committee when there is a gap in knowledge. Need facts before confronted with questions and meaningful discussion.
iii. well lead good information
iv. There was initial confusion and a lot of ideas put forth. We will see how they are sorted out.
v. To clarify - I put C last only because so much of that depends on A; B, too. More/less useful was heavily influenced, I think, by available. time. Also, with more time, moderators might have been able to draw out those attendees who spoke less.
vi. Great idea. Worked out well.
vii. I was facilitating the Groundwater and so cannot rank the three sessions.

Question 4a. How aware are you of the existing regulations and policies at the county and state level that promote forest preservation and connectivity? (Very familiar, somewhat familiar, not familiar).
8 responses

Very familiar (4)
Somewhat familiar (2)
Not familiar (2)

Question 4b. Do you think existing regulations and incentives at the state and county level are sufficient to maintain forest preservation and connectivity within Calvert County?
8 responses

No (3)
Don't know (1)
Yes, if followed (1)
Adequate at this time but open for review as the growth continues (1)
Relatively good, our minimum lot size in critical area has been paramount in protecting buffer zones and private forestland. (1)
I would like to see 100% of forest maintained (1)

Question 4c. In what ways could the county's Comprehensive Plan update promote increased forest preservation and connectivity?
8 responses

i. Not familiar enough to comment reliably, but - maybe more outreach? Something to make it fun – participate in programs and get a free birdhouse or bathouse, mason bee house, or other ways to attract wildlife. Or offer particular native plants that are useful for pollinators, food, etc. Re: new developments – I don't know much about this, but: to what extent are gaps in forest cover important? If a large area of forest is cleared for development, does it make more sense to have winding threads of forest connecting forest edges, rather than a cluster or 2 with large gaps between them and the forest?
ii. more ag and forest preservation programs for smaller land owners, 10 or less acres
iii. Don't know if it's necessary. Must balance between growth in county and preservation.
iv. increase acres in preservation
v. Reinstate the Critical Area Reforestation program. Require developers to leave stands of trees. Require strip malls to leave trees between the mall and roadway, or plant native trees if none exist.
vi. Ensure tree cover minimums in each town center. Prioritize forest preservation for purposes of: water quality, air quality, quality of life, wildlife, etc., etc.
vii. Identify and protect hubs and corridors
viii. The update must keep or increase forest preservation goals. Benchmarks and reports must actually be measured and reported.

Question 4d. How can individual citizens support forest preservation and connectivity efforts if they are not property owners?
8 responses

i. Tenants should be able to participate in plantings, encouraging wildlife (via the idea of birdhouses etc. mentioned above). Communal/neighborhood plantings and other conservation activities?
ii. good question, one I don't have an answer for
iii. Participate/learn about efforts.
iv. support forestry board and other groups that promote tree planting
v. Support requirements for forest preservation. Help plant trees in parks, other public areas.
vi. Join the Calvert Forestry Board!
vii. work with land trusts!
viii. Vote for Commissioners that value the environment and the rural character of Calvert. Hold them responsible. Keep educating yourself about the science and the issues.

Question 5a. Do you think stormwater is being managed effectively in Calvert County?
8 responses

i. no (4)
ii. don’t know, need regulation and statistics to determine (1)
iii. could be better (1)
iv. Poorly in most areas (1)
v. Only if regulations are enforced (1)

Question 5b. What innovative stormwater management practices do you see being using in the county and where?
8 responses

i. the holdng tank that was installed at the dares beach roundabout
ii. Would be good if water is being captured, recycled for other uses.
iii. not easily noticable or publized
iv. Innovative? The county seems to think stormwater can be controlled by retention ponds when it should build up and use swales and extensive ground cover to hold the soil. Bulldozing and removing existing vegetation leads to erosion and colonization by invasive plants.
I'm not knowledgeable enough to really know what counts as "innovative"... I don't think I've seen much other than basic minimum techniques, like runoff fences...
vi. We had to dig 5 huge stormwater pits when we built our house 12 years ago. That's pretty stringent and seems to take care of roof run-off.
vii. behind the Prince Frederick Library
viii. rain gardens :)

Question 6. Do you think Calvert County residents know what environmental problems/issues are most threatening to their quality of life?
8 responses

i. No (3)
ii. No. The county needs to compose a summary of the regulations and statistics in laymen terms and disseminate to the residents. (1)
iii. I seriously doubt they do (1)

iv. It varies for everyone but I think many are aware (1)
v. Not really, but that assumes residents measure "quality of life" the same way... (1)
vi. Not all of them. (1)

Question 7. How have you learned about environmental issues important in Calvert County? Mark all that apply,

Local, state, federal websites or informational pamphlets	100.00%	8
Informal education (museums, public outreach events, personal investigation)	87.50%	7
Newspaper articles, letters to the editor	75.00%	6
In response to a specific event (e.g., Dominion Cove Point, development project, building codes)	75.00%	6
From friends/family	62.50%	5
Formal education/ training	50.00%	4

Comments on Question 7.
6 responses

i. The county needs to make more of an effort to educate its citizens. Provide a summarized booklet on the primary issues, reqs/regs., current stats, impact, etc. written in laymen's terms and disseminate so the citizens are aware of these issues.
ii. Comment on ranking below. LTE are often read by many but can be very misinformed.
iii. Master Gardener training, Chesapeake Bay Foundation, other local organizations.
iv. Personal experience - being outside, personal observation
v. Member of Calvert Forestry Board, Calvert Citizens Green Team, Economic Development
vi. Commission - all have addressed local environmental issues.

Question 8. Which of these public education/outreach approaches do you think would reach the most county residents across all age groups? Please rank these approaches from most (1) to (9) least effective.

8 responses

High score indicates most effective, low score indicates least effective.

	Score
Environmental education outreach booths at other public events (e.g., county fair)	6.86
Public meetings/presentations	5.75

Newspaper articles	5.75
Green expo events	5.71
Informational mailings/ emails	5.57
Letters to the editor	5
Exhibits (e.g., at Calvert Marine Musuem)	4.86
Online surveys	3.38
Telephone surveys	2.38

Appendix D. Additional Summit feedback

A major goal for the Environmental Summit was to solicit ideas from Calvert County residents on a range of environmental topics---before, during, and after the 2016 event. The EC received three post-summit feedback emails so far that are summarized here.

On November 29th, 2016, Frank Allen, a leader of the Patuxent Tidewater Land Trust, was stimulated to think more about groundwater protection in Calvert County after this important issue was discussed at the Summit. He sent us several suggestions for conserving groundwater from stressed aquifers in southern Maryland. In his email, Mr. Allen asked the question, "...*why are we drawing so much groundwater in the first place? We average over 40 inches of rain a year--the driest 12 month period I have logged in 21 years here is 29 inches."*

His email went on to say, *"It is inconceivable to me that commercial users are permitted to use groundwater for once through cooling or other industrial uses. The Cove Point gas plant should be required to recycle cooling water; as long as they continue to use ground water they should be assessed water charges based on service water fees charged to residential customers. Charging such fees will provide a strong inducement for them to apply water conservation measures. The groundwater is not "free". Once it is gone, it is gone.*

If Calvert does not yet have a gray water code, it should implement one, install gray water systems in county owned properties and provide strong incentive for installation of gray water systems in residential, commercial and industrial properties.

Rainwater harvesting should be strongly supported. Swales, rain harvest friendly parking lot and road curbing and other water gathering features should be built into highway and building planning. Rainwater storage in ponds and cisterns should also be strongly supported, although with careful consideration of mosquito control in design and maintenance. As a bonus these water capture features will also serve to reduce the severity of flash flooding and erosion during heavy rain events

Residential water conservation should be expanded beyond just low flush toilets. Gray water and captured rainwater could be used to water plants in peoples' yards. On our property we have a rain barrel off of our house and a 1500 gallon tank (with frogs in it to eat mosquito larvae) gathering water off of our barn. This year we used over 8000 gallons of water from the larger tank for livestock watering and irrigation of plants. That was 8000 gallons we did not need to draw from the aquifer.

Bayscaping and xeriscaping should be the preferred practice. Lawn watering should be prohibited except possibly for establishing lawns. Lawns in general should be discouraged.

Dry land farming could become increasingly difficult in the coming years due to the anticipated climate shifts that we have already started to see (heavy rain, drought, heavy rain, drought....). Measures need to be taken to limit the amount of groundwater farmers use in response to these changes. They need more drought resistant crops and seed strains. Planting and harvesting measures to reduce runoff and limit erosion should be encouraged such as contour plowing and

a longer term vision, terracing. Drip irrigation could be used for row crops and perennial plantings. Surface water should be used wherever possible. Large cisterns and farm ponds need to be installed. Zoning changes may be required to permit such utilities, and the farmers may need help in identifying funding support for developing these water supplies. There are programs that will pay for much of the cost of creating farm ponds which also can serve of water supplies for fire fighting."

On November 28, 2016, the EC also received an email from Albert Tucker, President of the Board of Trustees for the Chesapeake Environmental Protection Association. He suggested that we are missing critical data/answers to these questions:

1. What are the patterns of existing development in Calvert County?
2. What is the current sentiment of county residents, and what do they perceive as threats to their quality of life?

Mr. Tucker's email went on to say, *"The data exists to answer* [question] *1, but the expertise for citizens to access is limited. I think that some sharp students could generate answers. For number 2 we would have to generate surveys which are costly to have done. I have found some open source software that can generate answers. It was developed by MIT and deployed online successfully for the planning process in Des Moines, IA. What distinguished it from other approaches is that it prevented people from asking for everything and forced choices. Again to deploy it would take someone with database experience. The answers to 1 would allow us to* [see] *how development patterns are encroaching on the critical ecosystem service areas. The answers to 2 would let us know what people are willing to pay for. (Actually we could design this survey to illicit more information than one specific question) With information we could demonstrate to decision makers what residents feel are the most important issues facing them."*

On January 18, 2017, Albert Tucker sent the EC another email with a website from the Association of New Jersey Environmental Planning Associations (http://www.anjec.org/html/buildout/htm). Mr. Tucker pointed out that the topics featured on this website, Build-Out & Carrying Capacity, discussed how carrying capacity may limit land use well before build-out is achieved. Some towns in New Jersey are shifting their views, are acknowledging the carrying capacity of natural systems, and conducting capacity analyses to help them make decisions on land use and for setting build-out limits.