

**Chesapeake Bay Program Partners’  
Local Government Forum  
Proceedings**

**Hosted by the Local Government Advisory Committee to the  
Chesapeake Executive Council and the Chesapeake Bay  
Program’s Land Use Workgroup**

**June 7, 2017  
Annapolis, MD**



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# Chesapeake Bay Program Partner's Local Government Forum

## Proceedings

Edited by Peter Claggett, U.S. Geological Survey and Lindsey Gordon, Chesapeake Research Consortium

This forum was convened by the Alliance for the Chesapeake Bay (Alliance), in cooperation with the Local Government Advisory Committee to the Chesapeake Executive Council (LGAC), and the Chesapeake Bay Program's (CBP) Land Use Workgroup (LUWG).

## Forum Synopsis

### Background

A joint forum of the Local Government Advisory Committee to the Chesapeake Executive Council and the Land Use Workgroup was held on June 7, 2017 in Annapolis, Maryland at the Crowne Plaza Hotel. The theme of the forum was "Future Land Use Scenarios Relevant to Local Planning Decisions to Maintain Water Quality". A copy of the agenda may be found in Appendix B.

The purpose of the forum was to learn about the potential use of future scenarios to inform local restoration and conservation actions, explore possible scenario narratives and assumptions, and build consensus around a subset of scenarios to inform Phase III Watershed Implementation Plan (WIP) development. The Alliance's approach was to engage land use planning and policy experts to review historic trends, describe relevant current policies, and gain sufficient understanding of the methods used in developing these scenarios to enable them to review and build consensus around a set of proposed alternative future scenarios.

The Phase III Watershed Implementation Plans, which are due in April 2019, must account for anticipated increases in nutrient and sediment loads associated with population growth between 2019 and 2025, the end date for meeting the Chesapeake Bay TMDL goals. One way to account for changing conditions is to compare plausible scenarios of future land use with current conditions. The Chesapeake Bay Land Change Model (CBLCM), developed by the U.S. Geological Survey at the Chesapeake Bay Program (CBP) Office, is designed to simulate future land use conditions for the year 2025 based on county-level population and employment projections while accounting for local zoning, the suitability of land for development, slopes, housing and employment densities, and other factors. These forecasts can be directly used in the CBP Partnership's watershed model to estimate potential changes in nutrient and sediment loads that would result from changes in land use.

Under the direction of its Land Use Workgroup, the CBP Partnership plans to develop several future land use scenarios to bracket the range of potential changes in land use resulting from a continuation of historic trends and/or partial buildout of lands zoned for development. The CBP Partnership would like to get as much local input as possible for designing future land use scenarios so that they are locally relevant and useful for [Phase III WIP](#) development.

## Forum Objectives

- Refine the Historic Trend scenario (aka "Business as Usual").
  - Do the forecasts appear plausible? If not, why?
  - What information is needed to improve the Historic Trend forecasts?

- Identify alternative future scenarios that are plausible and useful.
  - How might the future differ from historic trends?
  - What policies and actions support the realization of alternative scenarios?
  - Which scenarios are most plausible and useful to the Bay jurisdictions for informing the Phase III WIPs and other state and local decisions?

## Participants

Over 60 participants were present at the forum on June 7, 2017, representing local, state, and nonprofit organizations from across the Chesapeake Bay watershed. The workshop was geared toward individuals who had knowledge and expertise related to land-use trends and policies in their jurisdiction. A complete list of participants can be viewed at the end of this report (in appendix A).

## Format

The workshop began in the morning with presentations and a large group discussion soliciting feedback on the Historic Trends scenario, followed by individually moderated small group work sessions in the afternoon focusing on alternative future growth scenarios based mostly on current and/or potential policies for managing growth. The workshop concluded with a large session where collective priorities and metrics for alternative future scenarios were discussed and prioritized.

## Preliminary Outcomes

The outcome of the forum was to develop a vetted set of future growth scenarios to simulate in the Chesapeake Bay watershed, with particular relevance for developing Phase III WIPs and assessing the magnitude of growth offsets that might be required. The top prioritized alternative future scenarios developed at the conclusion of the forum included the following alternative future growth scenarios (with significant additional detail in the body of the report):

1. **Utopia:** Combination of scenarios #2 – #5, discussed below.
2. **Current Policy and All Infrastructure:** Current growth management policies and zoning combined with planned transportation and other infrastructure (e.g., sewer and water) improvements and constraints.
3. **Conserving and Land and Preserving Rural Character scenarios:** Up-zoning suburban/urban areas and down-zoning rural areas combined with aggressive land conservation, with the goal of maintaining natural resources and rural open space.
4. **Infill and Redevelopment:** Added incentives to promote infill and redevelopment.
5. **Climate-Based:** Restricting development in areas prone to sea-level rise and storm surge.

Finally, forum participants discussed assumptions, policies, regulations, and other factors that pertain to each of these scenarios, which are described in detail in the small group discussion summaries below.

## Forum Welcome and Introductions

At the beginning of the forum, Hon. Bruce Williams, Chair, Local Government Advisory Committee (LGAC), Karl Berger, Chair, Chesapeake Bay Program's Land Use Workgroup, Metropolitan Washington Council of Governments provided the welcome to the meeting. Then, Mary Gattis, Director of Local Government Programs, Alliance for the Chesapeake Bay, provided an overview of the meeting purpose and facilitated participant introductions, which involved sharing a one word hope for the Chesapeake Bay watershed, which included:



- Forests
- Results
- Commitment
- Awareness
- Planning
- Sustainability
- United
- Balanced
- Infill
- Buy-in
- Swimmable
- Anacostia
- Vibrant
- Engagement
- Inclusion
- Thriving
- Consistency
- Fisheries
- Thoughtful
- TMDL
- Crabs
- Ecosystems
- Public buy-in
- Recreation
- Funded
- Preservation
- Progress
- Clean
- Restoration
- Protected progress
- Fish
- Clear
- Coordination
- Data
- Healthy
- Viable agriculture
- Training
- Clarity
- Closure
- Science
- Conservation
- Accuracy
- Enhancement
- Smart
- development
- Patience
- Water quality
- Resilient
- Fact-based
- Connected
- Benthic
- community
- Research
- Cooperation
- Collaboration
- Engaged

After meeting introductions, Mary introduced meeting guidelines which included: acronym alert (spell out acronyms the first time they are used); don't let yourself get lost; have fun; all ideas are welcome (as well as brevity); and use "ditto" to voice support for an idea that has already been expressed.

## **Presentations and Feedback on Historic Trends**

In preparation for three small group break out discussions later in the day focused on alternative future growth scenarios, two presentations were shared in the morning that focused on an introduction to Chesapeake Bay future scenarios as well as future scenario planning in the Delaware Basin. In addition, participants also shared questions, feedback and critique of the current scenarios during the morning.

### **Introduction to Chesapeake Bay Future Scenarios: Narratives, Assumptions, Evaluation Metrics; and Applications - Peter Claggett, U.S. Geological Survey**

Mr. Claggett's presentation provided an introduction to the Chesapeake Bay future scenarios and discussed the reasons for forecasting growth in the Chesapeake Bay, how forecasting is conducted and what data sources are used, as well as model capabilities and sensitivities. In addition, Mr. Claggett discussed the value of forecasting beyond 2025 and provided highlights of different maps and scenarios. A copy of the presentation, as well as handouts, are available in the Appendix C.

### **Feedback on Historic Trends**

After Mr. Claggett's presentation, the meeting facilitator, Christine Gyovai of Dialogue + Design Associates, invited forum attendees to review the Historic Trends scenario as maps of forecasted growth by state, summarized by tract/municipality, and tables with statistics on county-level population projections and estimated infill/redevelopment rates. Forum attendees were asked to individually consider the following questions:

- **What do you see in the maps and tables that you agree with and why?**
- **What have we missed?**
  - *Such as development in areas experiencing net declines in population and/or jobs or subject to environmental limitations; Changes in socio-economic conditions and/or consumer preferences that might influence the location of growth; Existing transportation/Infrastructure projects; Existing policies and plans not reflected in trends; and other ideas.*

During a break, participants walked throughout the meeting space to view the maps highlighting the current trends, wrote responses to the questions above on individual sheets of paper, and discussed the Historic Trends scenario with model experts from the U.S. Geological Survey (USGS). The individual responses that were submitted at the end of the Forum are compiled and included in Appendix D.

After the break, forum participants joined in a large group discussion to share their feedback to the

two questions above. The critique of historic trends focused on four core themes including “ground-truthing” (or testing assumptions on-the-ground in jurisdictions) the Historic Trends scenario findings, adding clarifying information on the maps such as a legend or additional key information, including parameters such as utility service areas and future land use considerations, and updating information for specific areas and jurisdictions. General questions about the Historic Trends scenario are included below, followed by feedback around display considerations, geographic considerations, additional parameters, and future land use considerations.

## Questions Regarding the Chesapeake Bay Future Scenarios

- Regarding the grey areas on the maps – is that the model projecting no growth, or was there not data available?
  - Peter Claggett’s response: That is where the population projection is essentially negative or zero, with the exception of D.C., where projections are forthcoming.
- What’s the difference between a projection and a trend?
  - Response: Population projections are produced by demographic models and through cooperative negotiations among jurisdictions. Population trends are the result of linearly extrapolating population data through time.
- For the 2030-2040 time frames, how will climate change or sea level rise be included?
  - Response: One way we anticipate incorporating sea-level rise is using maps of inundation based on the latest topography/bathymetry data. We would add that layer into our models as a constraint. Other aspects of climate change like changes in temperature and more frequent and/or severe storms are still being considered.
- What information was taken out of the domain of developable lands?
  - Response: The Chesapeake Bay Program (CBP) assessment of pervious lands available for new development excluded steep slopes, which were defined uniquely state-by-state, protected lands and easement areas, impervious surfaces, water, and tidal emergent wetlands.
- Did you consider growth zones? For example, Kent County, Delaware has a portion in the Chesapeake that’s not as conducive to development.
  - Response: We didn’t account for it in the Historic Trends scenario, but will account for it in the Current Policy scenario.



## Historic Trends Scenario Feedback

### *What do you see in the maps that you agree with, and why?*

- The Shenandoah Valley in Virginia appears accurate and is consistent with peoples’ expectations. However, the Winchester, Virginia area may need further exploration.
- There was support for modeling new growth adjacent to existing growth, along with projections that follow major transportation corridors.

## **What have we missed?**

### **Display considerations**

- The intensity of development (i.e. infill) should be shown more clearly on the maps.
- A legend is needed on the maps, to show the percent of suitable land that is projected to be developed by 2030.
- Display additional base layers and reference layers, such as imagery and transportation networks, to provide more context for interpreting spatial patterns of growth and why specific counties have high projected growth on the maps.
- Subtleties of why growth exists in certain areas should be more contextualized in the maps to help readers interpret these results.
  - For example, a participant said, “If I were to show a map of PA to someone not in this room, I would have a hard time explaining why Bradford and Lancaster Counties look almost the same. I had a hard time understanding until someone else explained it to me.”
- To further inform the historical trends, the creation of an outlier map to be compared to 2016 population estimates for cities and counties would be helpful.

### **Geographic considerations**

- Growth in Washington D.C. should be visualized to identify data needs for the locality and the Chesapeake Bay Program.
- Zoning is not mandated in Virginia, which could impact both the Historic Trends and Current Policy scenarios. However, most localities have some type of zoning data.
- Question from participant: Regarding the sources for your projections in Virginia, can you use MWCOG (Metropolitan Washington Council of Governments) projections instead of statewide projections? They are more reflective of the jurisdictions’ zoning and comprehensive plans.
  - Response: For the Washington COG area, and for the Baltimore area, we did use their forecasts and assumed that they were more accurate than the state forecasts.
- Question from participant: How is the model projecting sustainable growth? And to what degree does the model factor in millennial/generational trends? Walkability is a big factor for many, and some areas need to be vetted on the ground. For example, Salisbury on the eastern shore is currently showing little growth. However, substantial growth is taking place right now.
  - Response: In the Historic Trends scenario, we have current easements, but not anything about potential future preservation activity. We have the capacity to simulate conservation by land use. We’re also aware of millennial trends, but won’t be simulating those. With the high-rises in Salisbury – we rely on aggregate growth estimates (projected population and employment) for the whole county and then allocate that projected growth to locations our model tells us are likely to grow. Because future demand for land is seldom high enough to affect all eligible areas, and because our model produces 101 Monte Carlo simulations for each scenario, future growth will not be allocated to all areas eligible for growth. With better local information on the locations for planned new developments, we might be able to address this issue.
- It would be helpful to solicit jurisdictions’ feedback or agreement on the population and employment projections.



- The available developable lands need to be ground-truthed in the jurisdictions to ensure those delineations are accurate.
- Consider the real limitations on land development in certain localities. For example, on the Virginia maps many of the areas that are shown as developable wouldn't be able to be developed due to limitations of steep slopes and soils, or in places like Charles City County, due to lack of public sewer and water. Noting the service areas for water and sewer would be useful.
- It would be helpful to represent information in terms of change in land use type, such as impervious surfaces, forest change, or changes in nutrient loading and to show the consequences of these projections in the maps.
- The maps showing the Delaware portion in the Bay look accurate, but the current amount of growth happening on the west side of the state does not appear to be accounted for in the maps.
- Northwest Virginia looks reasonable, but in Winchester or Frederick counties, the projections for population growth should be higher. Eastern Frederick doesn't look consistent with local projections.

#### **Additional parameters**

- Consider up-zoning and down-zoning.
- Consider the availability and capacity of all infrastructure including water availability, wastewater, sewer, soil capacity, and all utilities.
  - Noted that many wastewater treatment plants are serving multiple jurisdictions in the Historic Trends scenario.
- The projections should show the potential influence of heavy or commuter rail lines and their future increasing usage. Highway projects or bridge enhancements should be included that could change growth patterns. (ex: rail-line in Spotsylvania County and Stafford Bridge in Maryland).
- Existing or future utility service areas should be factored in to the Historic Trends scenario.
- Identify the major employers in growth areas to help ground-truth future economic trends and projections (and future viability of large-scale employers).
- Much of the population lives in urban service areas, but the majority of land loss is on septic (which generally covers 2-5 acre properties). Having information about percolation data for soils consistently across the watershed would be helpful.
- Federal facilities are important to consider.
- Add groundwater restrictions as a consideration for the scenarios.
- There is a need to talk with local planners to get a full picture for future scenarios; coordination with the American Planning Association could help.

#### **Future Land Use considerations**

- Consider the future ownership of land, particularly of lands that are now in agriculture and forestry use. Many areas are converting to second-home ownership and to vacation homes, particularly along the Virginia shore of forested lands near rivers.
- Note that not all growth is related to population. For example, in Hardy County, WV, there is a large second-home community, but the population growth isn't reflected in

new development. Showing new and projected development would be helpful.

- Response: There were issues in Charles County as well, but it wasn't an environmental constraint – it was the lack of forecasted population growth. There is data on soil building suitability, which is something that might be helpful to incorporate.
- Response #2: Soil surveys are typically not accurate enough on the percolation level to determine building suitability, which means it results in scale issues for how growth is allocated. However, it is something that would be helpful to try to incorporate.
- Consider demographics carefully for the Historic Trends scenario as demographics will really dictate the manner in which locations develop. For example, in King George, VA, we were planning for schools, but now aren't expecting any increase in our school-age population.
- Take into account the remaining parkland after future growth projects are accounted for.
- Note that when you take out all of the land unavailable for development, there is not much room left to change.
- Consideration of how trends are projected is important, as they will be key for Watershed Implementation Plan (WIP) development.

## **Alternative Future Scenarios – Dr. Claire Jantz, Shippensburg University**

After the discussion and feedback around the Historic Trends scenarios, Dr. Claire Jantz's presentation focused on why and how alternative future scenarios focus were created in the Delaware River Basin, lessons learned, information about the utility and practicality of alternative futures, as well as considerations around potential pairing with other models.

Questions from the group following the presentation:

- Who was the client for this information?
  - The response was that local governments were the primary client, along with a variety of planning participants.
- Why 2070 was chosen as a particular time frame?
  - The response was that the client wanted to plan for the long term.

## **Alternative Futures Scenario Priorities and Considerations**

Following the morning discussion and presentation, forum participants took a break for lunch and then reconvened for small group discussions in the afternoon. Participants divided into three small groups organized by geographic region. There was a facilitator, flip chart recorder, and computer recorder in each of the small groups. Mary Gattis facilitated the Virginia and West Virginia small group (VA + WV), Renee Thompson facilitated the Maryland, Delaware, and Washington, D.C. small group (MD, DE, + DC), and Antonia Price facilitated the Pennsylvania and New York small group (PA + NY).

The focus for the small group discussions was to develop a prioritized set of alternative future scenarios and to discuss policies, regulations, and other factors contributing to each theme (making them possible). Small group facilitators reviewed the alternative future scenarios that Peter Claggett

shared during the morning presentation, and examples of policies, regulations, and infrastructure improvements. These included:

*Alternative Future Scenarios*

1. Historic Trends
2. Current Policies
3. Land Conservation
4. Rural Character
5. Infill and Redevelopment
6. Deregulated and less-managed growth
7. Distributed, amenity-driven growth: satellite cities and small towns
8. Concentrated growth along major transportation corridors

*Examples of factors that may influence scenarios:*

1. Policies & Regulations
  - a. Property and income taxes
  - b. Tax incentives (e.g., to encourage revitalization)
  - c. Zoning
    - i. Environmental protections (e.g., stream/ shoreline buffers)
    - ii. Transfer of Development Rights
  - d. Forest and farm conservation
2. Infrastructure Improvements
  - a. Roads and bridges: outer beltway, 3<sup>rd</sup> Bay Bridge, Water supply and treatment, High-speed internet
3. Parking lot issues (important for narratives but not controllable)
  - a. Technological innovations
    - i. Driverless cars, Better batteries, Decentralized electricity generation
  - b. Regional/National/Global economic policies and factors
    - i. Commodity prices, Trade policies, Domestic and international migration

Below is a summary of each small group discussion, followed by a presentation of the prioritized scenarios by each small group when everyone reconvened as a large group. During the small groups, participants focused on the following questions:

- What themes/scenarios are missing from these lists?
- Which themes/scenarios would be most plausible and useful to simulate?
- What policies, actions, and or other factors may happen over the next 10-30 years to support the realization of the most plausible and useful scenarios?

## **Virginia & West Virginia Small Breakout Group Discussion**

### **General feedback and questions**

- Can a city use these scenarios outside of an MS4 to offset reductions they may not be making?
  - Response: At a local level, a jurisdiction could use this information to determine how much work will have to be done between now and 2025, with the recognition that the adoption of certain infill policies may reduce the workload for offsetting those loads.
- Will these scenarios consider that policies may affect change?

- Note that West Virginia is not a Dillon Rule state, but that Pennsylvania is; perhaps Virginia and Pennsylvania could work together to develop alternative future scenarios.
- Participants suggested how to produce results that distinguish between different types of growth: how much did commercial, residential, mixed use, and industrial land uses grow? A follow-up suggestion included considering agricultural intensification as a unique form of growth.
- Participants also suggested forecasting land use to a later date than 2025. This would help account for scenarios that operate on longer time-frames, such as a climate-based scenario, in which sea level rise impacts may not be realized until 2050 or later.

Mary Gattis, who was facilitating the small group, asked each participant to **record scenarios that they think are missing in the provided list**. Suggestions for scenarios are listed below:

- Recommendation to include a greater explicit focus on water quality. In other words, what would the landscape look like if it were designed to protect drinking water supply, reduce the largest sources of load, and meet the water quality goals under the TMDL? This would essentially work backwards from stated water quality goals to produce a best-case land use scenario.
- There was a suggestion to model fringe development around an urban center. This would include concentrating growth around urban areas, but would also consider infrastructure that may be able to absorb population growth without resulting in construction.
- Geologic scenario: Include datasets of geographic variables as limiting factors. For example, karst topography serves as a limiting factor to development.
- Climate-Based scenario: This would include data related to subsidence, accretion, and sea level rise. In this scenario, population growth would not occur near water bodies, but would shift inland. This scenario was suggested by multiple participants.
  - A few participants noted that a scenario in which growth is focused along coasts should not be recommended.
  - Another participant made the case that visualizing growth concentrated on water bodies would still be a useful scenario, and supported the idea of a climate-based scenario.
  - An attendee noted that this scenario would require forecasting land use to a later date than 2040 in order to see environmental changes.
- A Planned Infrastructure scenario was suggested: This would assume that all development that is planned or in the process of being planned would be fully executed in the near future. This scenario would help serve as a worst-case scenario for jurisdictions to visualize the extent of impervious surface growth if their current projects are implemented as-is.
  - Several participants made follow-up suggestions to consider transportation projects when projecting growth, with the recognition that in some instances, growth will deliberately not occur near transportation corridors based on policies in place.
- Vacant Housing Stock scenario: This scenario would account for existing housing capacity to absorb new population growth. If a community has a high capacity, population growth would not spur significant development compared to a situation in which the housing capacity is reached.
- Green-Technology Developments scenario: Assuming there are advancements in green-technology, how would this impact growth projections? Included in this scenario would be consideration for how expanding solar-power infrastructure will increase land

- development, specifically in relation to agricultural land.
- Mixed-Use Growth scenario: In this scenario, development and growth would be localized to minimize transportation. For example, future development would cluster resources such as grocery stores together with neighborhoods so that commercially zoned areas and residentially zoned areas would be blended.
    - There was a suggestion from participants that this scenario could constitute a combination of previously suggested scenarios.
  - Political Landscape scenario: Recommendation to consider how federal and state policies may affect the ability of certain localities to develop.
  - There was a suggestion to analyze how increasing median household income would affect where and how growth occurs.
  - An attendee suggested a metric by which to evaluate the alternative future growth scenarios. They suggested conducting an analysis to look at the impact of green infrastructure development relative to past nutrient and sediment loads. This would help localities determine if their development interventions had an impact on nutrient and sediment loads to the Bay.
  - Another participant raised a suggestion for a metric by which to evaluate the scenarios: to examine any co-benefits associated with the assumptions and practices informing the scenario. For example, jurisdictions should consider co-benefits associated with land conversion when evaluating a scenario.

Mary then asked participants to review the list of suggested scenarios, and **rank the top 2 scenarios** that would be most plausible and useful for jurisdictions. The aggregated results of this ranking are provided below, where 1 represents the highest priority scenario:

1. Combining Land Conservation & Rural Character into one scenario, which includes reducing farmland/forest fragmentation, was the **top priority**.
  2. Infill & Redevelopment Scenario, including smart growth and green infrastructure.
  3. Transportation Infrastructure and Corridors: this scenario would assume that all planned infrastructure projects are implemented, and that growth concentrates near transportation corridors (unless otherwise stated by policy and zoning information). This scenario also factors in infrastructure constraints, specifically related to sewer/septic areas.
  4. Climate-Based: This scenario would include projected data for land subsidence, accretion, and sea level rise. Population growth would not occur near water bodies, and this scenario would best be represented when modeled past 2025.
  5. Combination of Historic Trends and Land Conservation: this scenario would use conservation policy and implementation to offset impacts of projected population growth.
- Mary Gattis suggested considering a Transect Scenario: this would divide land use into six sectors, where each sector has a different scale of development. Then population would be distributed along each sector, such that the infill and redevelopment sector would have high population growth, and rural lands would have low population growth.

The group then prioritized their top recommendations to bring back to the larger group to present, as noted above.

## **Delaware, Maryland, and Washington D.C. Small Breakout Group Discussion**

## General feedback and questions

- Climate Change and Sea Level Rise scenarios are important for planning infrastructure, communities, health, etc. Saltwater intrusion was also raised as an issue as it will alter the soil composition.
  - Adaptation and resiliency to climate change should be considered as well. How do we count in resilience and adaptation measures?
  - Adaptation and mitigation are important, and both types of action should be represented in any Climate Change scenario.
- One participant asked the group to define “rural character.”
  - Response: An area that has large lot zoning and is not as intensive in development. That scenario increases the potential for rural areas to absorb growth and development as urban centers become saturated.
  - Do we have the baseline that we can measure alternative futures by?
    - Renee Thompson clarified that the historical trends are our baseline for the past, and the alternative futures are options or pressures that could change from the historical trends.
- Infill and Redevelopment should be separated out into different factors, as they have different end results in land use/cover that have water quality impacts. Infill as defined in some areas is the “filling in” of greenfield near urban areas. Redevelopment is where existing development is changed to accommodate higher density. From a water quality perspective, redevelopment is better than infill. The most impactful to water quality improvement is redevelopment, and infill tends to degrade water quality.
  - The land change model definition related to infill and redevelopment of those two things is slightly different; for the model it is the amount of housing that was absorbed into the existing urban footprint but was not seen as a change in land cover on the landscape. Definitions and clear explanations related to communicating these scenarios are important to bring in to this process.
- The model may need to adjust for different jurisdictions looking for water quality improvements, since there are different stormwater regulations from jurisdiction to jurisdiction.
- There is a need to further quantify what effect the Infill and Redevelopment scenario would convey (particularly around whether there would be a load reduction).
  - Note that there will be a shift in land use as mixed-use development becomes more prevalent (do the current scenarios take this into account? For example, with redeveloped strip malls?).
- Consider the likely coming change or possible impending collapse in brick and mortar retail, and the impact on land use and development (for strip malls but larger malls as well).
  - Note that with the lack of wifi coverage, rural areas may be very under-resourced in the future if these commercial areas collapse.
- Alternatively, how will the potential expansion of information infrastructure in rural areas change the landscape?
  - Is a whole scenario missing that needs to be added, or are these assumptions or add-ins to all the scenarios that need to be considered?
- Peter Claggett asked the group: How important is it to build in internet infrastructure in projecting land use and growth?
- There is a need to consider wastewater treatment plants (WWTPs) and their projected

- capacity changes to accommodate changing populations.
- There is a further need to consider that there is a lot of new technology in wastewater treatment, so the net effect of that growth isn't linear to additional input loads. (Don't assume that a historic trend will equal a linear projection.)
    - Many areas (MD and DC) have already invested and got credit for WWTP upgrades. There will not be an incentive for some areas.
  - There is a need to look at the amount of capacity and discharge levels of WWTPs as they are very important at the municipal level, and at every level, and should be considered in the scenarios.
  - Renee asked the group: Should we have a standalone WWTP and internet scenario or add in to existing scenarios?
    - We need household development that will expand to WWTP vs. households that stay on septic as that will change water quality impacts significantly.
    - On the other hand, WWTPs add nutrients directly, and the other factors like internet or redevelopment are secondary/tertiary.
  - How should increasing animal operations to feed future population growth be considered in the scenarios?
    - Note that this question won't necessarily lead to an increase in nutrients as the scenario needs to relate to water quality.
    - One participant noted that they are replacing chicken houses with larger areas of free-range chickens, so the land footprint grows but the amount of chickens will stay the same.
  - How are we setting aside land for agriculture and farms to feed growing populations?
    - There was a bit of a divide in the group on how important agricultural expansion is. Some felt the water quality impact was not enough to warrant a scenario, and others did not feel this way.
  - A participant noted that there is a lot of international investment in chicken production in the watershed, and it might be worthwhile to look at international economic trends and how they might impact land use.
    - Another participant noted that international countries are buying land to produce food and ship it back to their countries too, so what does that mean for future land use in the watershed?
  - A question was raised about preserved and conserved agricultural land.
    - Renee Thompson responded that currently only conservation easements are preserved in the model, but they might also add in agricultural zoning and preservation district information to inform future agricultural land in scenarios.
  - Should Agricultural zones be included in a "policy" scenario?
  - A question was raised is the scenario supposed to be universal as the results would differ substantial if it is created around a local concern versus a watershed wide scenario.
    - Renee responded that they will be running the scenarios by state, and will be taking statewide concerns into account. Renee also noted that for the small group discussion, standalone scenarios could be considered or they can be consolidated into whatever seems most plausible to the participant.
  - There will be differences between local jurisdictions as well as what they will be interested in. There is hope to produce a range of scenarios in terms of water quality considerations from worst to best, with in-between scenarios having impacts on water quality.

- A participant noted that a “Business-as-Usual” scenario should be considered at the very least.
- A participant noted that a lot of these suggestions are mechanisms that will give us growth and development patterns, and there is a need to make a distinction between those and the big themes in these scenarios.
- Is there a need to define what is a factor/policy/action that will support or influence the themes?
- Infrastructure in urban areas facilitates infill, but infrastructure in rural areas encourages other things, like sprawl.
- With historical trends, does that assume current policy? Does that make any distinction between policies that could continue or those that are unsustainable?
  - There is a possibility to do a combination of current trends and future factors.
- Peter Claggett noted that they can make zoning and policies a soft or a hard guideline in the model -- whichever is most helpful.
- One participant noted that in Maryland, they use historical trends as a projection and they use current policies and zoning to determine how that projection is distributed.
- It might be helpful to consider a “Business as Usual” scenario, unconstrained, and a “Business as Intended,” constrained with policies put in place in the last 10 years. The distinction between business as usual and business as intended might be helpful.
  - It is important to consider historical trends vs. current policies and factors in place.
  - Renee noted that themes for consideration include redevelopment, a “Historical Trend-as-Future-Projections,” and business as intended would be “Policies-in-Place-Last-Ten-Years.”
- A participant noted that Delaware and Virginia don’t have land use authority, which is delegated to counties.
- Peter Claggett noted that they have zoning by state, but the data comes in by county. In those counties that don’t have zoning, they need proxies like infrastructure patterns. While there is variability within state, they need a consistent, narrative aggregated to the state level.
  - A participant noted that it is important not to assume that public policy will be the main driver of future growth and development as zoning is not the only factor to consider. In some places, drivers are local businesses, retiree destinations, other behavior changes, etc.
- Another participant noted that in the last year, the largest change in land use was renewable energy sprawl. So what happens to those large tracts of land in terms of land use projections? Or sprawl from increased highway usage due to self-driving cars?
  - Another participant asked if that may be a disruptive technology?
- Future annexation areas that should be included in the scenarios and determining water quality impacts in the model.
- Do all the scenarios have to be proposed now? There may be a need for some time to experiment with innovative scenarios after the forum to see what works and what else could be used.
  - Renee responded that the goal for the meeting is to talk to the experts and get a direction that everyone is comfortable with, and it may be that after the group revises the future scenarios, they make come back to participants for review.
- We need a current policy scenario that includes a lot of infrastructure that might be driving future growth.



## **Major Themes and Scenarios:**

- Historical Trends: Highest priority
- Hybrid Current Policy (Business as Intended): Looks at historical trends but incorporates recent policies' effects on landscape. This scenario would also include infrastructure, natural resources, etc. Highest priority
- Rural Character combined with Conservation - Hybrid (Utopia scenario): Growth will be redirected to conserve most possible natural resources and rural areas: Highest priority
- Discussion around the top themes and scenarios included:
  - It would be very helpful to consider infrastructure like WWTPs and load caps in consideration in those scenarios.
    - Renee noted that they could run that scenario with and without WWTPs as an added component.
  - Another participant noted that the WWTP issue matters a lot because state practices have a lot of variability, future technology may be quite different, and the future terms of the waste local allocation (WLA) cap are currently unknown.
  - Another participant noted that Rural Character and Conservation seem similar, as purchasing the land and zoning it achieves the same end.
    - There's a difference in local control as well—conservation is usually up to the individual landowner, and zoning is a government entity.
    - Note that the scenarios are hypothetical extremes of any rule—these rules are applied to all of the possible land rather than the piecemeal reality you will actually get.
- Renee summarized the top scenarios that had been discussed thus far which included: combined Infill and Redevelopment, and Conservation and Rural Character also combined into one hybrid scenario.
- Another participant brought up the issue of trading and offsets programs and the related shift in money sources and implementers to companies rather than governments.
- The deregulation scenario is laissez faire and will contrast with regulated and conserved lands.
- Renee asked the group: What about climate change and sea level rise (SLR)?
  - SLR is an important factor to development and should be included in these scenarios.
  - A few participants noted that “Climate” could be an add-on to any future scenario.
- Renee summarized the following potential top scenarios from small group discussion:
  - Business as usual (BAU)
  - BAU + recent policies
  - Infrastructure
  - Climate change
  - Redevelopment— note that this could include retail changes and reusing collapsed retail, and non-traditional redevelopment. Redevelopment and infill need to be defined clearly as they mean different things in different jurisdictions.
    - A participant noted that this could be positive or negative--deliberate or left alone

## **What policies, actions or factors support the development of these three scenarios?**

- Scenario/theme 1: Business as Usual (BAU), with only Historic Trends
  - One participant asked asked to clarify what “no constraints” means?
    - Renee replied noting that it means no future constraints of new policies or recent

innovations.

- Scenario/theme 2: Hybrid of BAU and new policies implemented as intended, with new infrastructure
  - It could be possible to expand the services from the urban center outward, and encourage densification to attract growth to the urban areas.
  - Note that most of these policies we have are historic and have been around for decades in a fairly heavily regulated landscape. What are the primary differences between scenario 1 and 2?
  - Are policies taken into account with the future scenarios?
    - Renee replied that this introduces the intention of the policy as a constraint in the scenario that isn't currently present in historical trend growth.
  - Another participant noted that the current historical trends scenario is taking areas of current density and expanding new growth near to where growth has already occurred, without any input from policies or actions.
  - An example of policy-influenced growth is that growth would be constrained to priority funding areas and planned policies.
- Scenario/Theme 3: Hybrid of Land Conservation/Infill-Redevelopment/Rural Character ("Utopia" scenario)
  - A participant noted that this scenario needs to incorporate constraints on growth like WWTPs, and the need that when there is overflow of the existing capacity, a release valve needed to be added.
  - Renee asked the group: What actions or policies would influence this scenario?
    - A participant noted that it would be possible to expand services from the urban center outward and encourage densification to attract growth.
- A participant noted that it might be helpful to identify policies or factors that you would like to see in any of these scenarios, such as new technology or infrastructure changes.
  - A participant noted that it is important to incentivize water quality improvement actions so any conservation scenario has to include federal-state assistance to municipalities.
  - It is important to allow flexibility around treatment facilities, either for building new plants or increasing capacity of existing plants.
- A participant stated that it would be helpful if we could better simulate the devolution of funds to municipalities to better simulate local control of land use changes (given that in some states the counties and municipalities have authority over that).
- Other factors to consider include the: Attitude of younger generations, business-friendly federal attitudes, availability and amount of block grants to local jurisdictions.

The group then prioritized their top recommendations to bring back to the larger group to present, as noted above.

## **Pennsylvania & New York Small Breakout Group Discussion**

### **Themes/Scenarios not currently captured in projections:**

- Antonia Price asked the group to brainstorm themes, scenarios, and considerations that are not currently captured in the eight scenarios provided.
  - Antonia reiterated the need to generate top three scenarios and policies necessary to

- make them a reality in the small group discussion.
  - The group recognized NY representatives were absent from the discussion and highlighted the need for watershed-wide focus and including NY in addition to PA.
- A participant noted that the impact of different types of land uses and how they are zoned by localities was cited as an important metric and impacts on water quality (including impacts on stormwater, TMDL, etc.).
- Utility Capacity and Restrictions need to be taken into account -- they must have capacity and resources for development to occur (reservoirs, tanks, etc.).
  - Examples include wastewater treatment plant capacity as a limiting factor for population growth, and high-speed internet as a catalyst for employment center development and growth in small communities. There is also a shift from current population centers to more rural areas.
  - A participant noted that included in this scenario should be sewer and septic system capacity (consider nutrient constraints in conjunction with population demands).
  - The substantial build out potential may not be currently captured in the scenarios. Note that once infrastructure is extended, these additional areas act as development catalysts that must be considered (at either end and between).
- Regarding Energy Policy and Development -- there are many shale communities in the watershed that generate significant amounts of revenue with small populations, so that may act as a confounding factor in growth projections. Pipelines may be next with unknown influence due to low employment potential, but high revenue and impacts on forests (and therefore water).
- Antonia suggested that the group think of broad-scale themes in order to distill down to a more narrow set of scenarios.
- A participant noted that the distinction between development, land suitable for development, and agricultural areas are all important to consider. Many projections don't account for the capacity for agricultural land to act as a hub for development, particularly as it relates to animal agriculture and the construction of impervious agricultural surfaces, but also in terms of intensification.
  - Several participants suggested that the group may want to include definitions of agriculture with Concentrated Animal Farming Operations (CAFOs) versus crops, or rating intensification related to water impacts and the economics that drive agriculture.
- Regarding transportation and improvement programs, it would be important to account for planned infrastructure and how that may interplay with population growth. Looking at long-range transportation plans- Transportation Improvement Programs (TIPs) – would be helpful to consider as well.
  - As they are not taken into account in the scenarios, several participants were unsure where the large transportation plans were coming from in the scenarios.
- A participant noted that it would be helpful to consider automation in the workplace and how that will impact employment availability and resulting population change. Where growth will go and how much will happen?
- Climate Change: how will increased sea level rise impact growth? Climate-related factors should be taken into consideration as well.
  - Floodplain protection is key in PA, and could change how population and development grows on the landscape.
- Economic considerations should include how salary increases will impact population

growth and rural vs. suburban.

- Considering green infrastructure (roofs, bio-swales, and green gutters): How effective are they and how will they perform over time? Regarding current best management practices (BMPs), how do they perform out to 2070?
- Healthcare, hospitals, public services, school quality all have an effect on where development occurs.
- Antonia then asked the group to identify themes and scenarios that would be most useful and plausible.

**Themes/Scenarios that are most plausible and useful:**

- Expanding the Land Conservation scenario to be more inclusive and include farms, forests, riparian areas, floodplains, wetlands and all areas that could be conserved would be helpful.
- Combine elements into a “Best Case” scenario with strong infill and redevelopment, smart growth, green infrastructure, along with land conservation and agricultural intensification/preservation.
- A participant recommended modeling decreasing effectiveness of BMPs and the impact that may have to future land use. (Note that this would not necessarily be considered a scenario, but rather a metric by which to evaluate.) The BMP longevity issue could be incorporated in multiple scenarios -- particularly related to Current Policies, Infill + Redevelopment, and a Green Infrastructure approach.
- There was a suggestion to model Historic Trends with conservation zoning.
- It could be helpful to redefine Rural Character scenario to Agricultural Activity – High Intensity, including more fine-scale data than county-level agricultural census information, and factoring in agricultural activity and capacity.
  - There was a recommendation to consider agricultural activities, and how they impact water quality. A heatmap of densities or types of agricultural operations could be helpful.
  - As agriculture intensifies, there should be some water quality-protecting interventions commensurate with that in the scenarios.
  - A participant suggested to blend this scenario with Infill and Redevelopment, but to also include utility restraints.
- Current Policy could be combined with Infill and Redevelopment scenario to include negative impacts of agricultural activity, and/or shifts in eating habits and impacts on land.
- Transportation and New Development could include residential and industrial transportation and development, and this scenario would consider the far-reaching capacity for increased population that new and improved transportation networks produces (the build out that comes from new development).
- Focusing on Current Policies and Rural Character separately would be helpful (there is a bias in discussions related to agriculture and CAFOs). There is an economic reality that we perceive as “rural” vs. agriculture. Most of PA watershed is truly rural. There is also the economics of CAFO’s close to urban centers to consider. Is it possible to take advantage of true rural area (through transportation) instead of letting economy drive concentrated farming? Foodshed planning should be included as well.
- Better and more reliable transportation should be included in the scenarios.

- Improved policies (especially environmental) in scenarios should be considered in the scenarios as well, particularly around how they apply to infill and redevelopment, as well as development.
- Utilities & Infrastructure: Combining roads, sewer, water, internet, transportation, and all other public services will help define where there is high population density, and where there is likely to be expanded growth.
- Discussion of policies that would support these themes:
  - The upzoning of rural areas.
  - Service-agreements: certain areas have agreements with utilities not to provide service outside of designated areas.
  - Policies to incentivize healthy activities for the Bay, especially related to transportation (e.g. Building out roads can have a negative effect). If there is improvement to include other types (like rail), that could be good, but there is a need to determine how to include and define that (and how to consider both sides of the coin, both good and bad).

**Top Themes and Scenarios (group conversation to combine themes above):**

- Infrastructure scenario- expand this scenario to include utilities, roads/transportation, sewer, water, internet, energy, green infrastructure, public and health services, etc. Impacts population and user density should be included as well.
- Agriculture scenario- is current missing the impacts of agricultural development on water quality (e.g. watershed plan shows too many animals, but we are still seeing growth. Agricultural development impacts surface water resources, but there is nothing is slowing it down). There is a need to look at high intensity agriculture and crops vs. animals/CAFOs, as well as the economy of agriculture including market dynamics/commodity price increases. There is a need to aggregate and integrate the land base and impacts.
  - As agriculture intensifies, there should be commensurate water quality or conservation to keep in step with the intensification including conserving wetlands, drainage areas to waterways on farms, keeping cattle out of streams. Mitigation is something to consider as well as the consideration that agricultural is a land use and business (including an economic driver).
  - Technological advancements/requirements/incentives to consider include manure digesters and vertical farming.
  - It is important to consider consumer preferences for a greater trend toward hormone free, free-range meats etc. to the animal intensification consideration only. Economic costs and land requirements are associated with free range should be considered as well potentially conducting a foodshed analysis with transportation and other impacts. There is a need to consider local level policies related to food sources.
  - There is a need for a separate and related effort to do agricultural census to 2030.
- BMP's could be included in the "Current Policies" scenario with a focus on water quality impacts in addition to stormwater management. Model the assumption that BMP effectiveness decreases as time goes on could be helpful and then see what happens to water quality. On the other hand, it might be helpful to model technology improving effectiveness of BMPs in the future, which may include improved municipal zoning.
- Automated workforce- large scale technological advances impacting population and

employment dynamics should be considered. The private sector with markets moving toward automation (cars, retail, other industry) should be taken into account as well -- some estimates say 20% of malls will be closed in the future.

The group then prioritized their top recommendations to bring back to the larger group to present, as noted above.

## **Building Consensus around a set of plausible and useful scenarios**

After the small group discussions, participants reconvened to share their top prioritized scenarios. Christine Gyovai facilitated a large group discussion that included clarifying prioritized scenarios for each small group, and then grouping and clarifying themes into a revised list for large group prioritizing.

### **Small group discussion prioritized scenarios**

#### **Virginia & West Virginia:**

1. Combining Land Conservation & Rural Character, which includes reducing farmland/forest fragmentation, was the top priority scenario.
2. Infill & Redevelopment, including smart growth and green infrastructure.
3. Transportation Infrastructure and Corridors: this scenario would assume that all planned infrastructure projects are implemented, and that growth concentrates near transportation corridors (unless otherwise states by policy and zoning information). This scenario also factors in infrastructure constraints, specifically related to sewer/septic areas.
4. Climate-Based: This scenario would focus on climate resiliency, and include projected data for land subsidence, accretion, and sea level rise. Population growth would not occur near water bodies, and this scenario would best be represented when modeled past 2025. It should be focused for the long-range and on buildable areas, specifically the most important factor is the shift in population as a result of climate changes.
5. The group had significant discussion on how 2025 is short-term, and that forecasts for specific scenarios may be appropriate for time-scales longer than 2025.
6. Additional scenarios that were considered include changes to policy and development based on current political climate, and the adoption of policies at state or local level may preclude certain other scenarios to play out.

#### **Maryland, Delaware, and Washington D.C.:**

1. Renee Thompson summarized the top three major scenarios recommended by the breakout group. They include:
2. Historic plus policy – both intended and infrastructure
3. Baseline and Historical Trends - Hybrid current policy (Business as Intended)—looks at historical trends but takes recent policies' effects on landscape, would also include infrastructure, natural resources, etc.
4. Rural character combined with land conservation and infill/ redevelopment hybrid ("Utopia" scenario): growth will be redirected to conserve most possible natural resources and rural areas.
5. The group also noted that re-development is more important than infill for the MD/DE/D.C. area, with a suggestion to separate out those two policies.

6. Considering how elements of the built environment will be repurposed will be important. In other words, is there growth capacity in certain areas that would be able to absorb future population growth?
7. There was a suggestion to model the effects of broad infrastructure development and the expansion into rural areas, and to consider changes in wastewater treatment plants and their capacity.

### **Pennsylvania & New York:**

1. Agriculture and agricultural intensity, including commodity prices, and different levels of intensity. Some policies that we considered include looking at food-sheds, where agricultural products are being shipped, land use impacts of free-range and organic production systems, and the policy implications of technology. In terms of land use scenarios, we would recommend considering the impact of utilities and infrastructure (such as road networks, rail lines, sewer systems, water resources), agricultural intensification as a depressant on agricultural growth but commensurate with population growth, and the effect of technological shifts. We recommend looking at the impact of stormwater and other water quality BMPs when evaluating these scenarios.
2. Build a scenario based on utilities and infrastructure including roads, internet, schools, sewer, power and rail. This would include looking at the impact of utilities on the watershed, long-range transportation plans (transportation corridors), and utility service areas' impacts on the likelihood of development.
3. Employment shift due to technology and retail -- technology and employment factors in the forecasts. For example, how will automation might development and population growth in certain areas?
4. BMP's should be taken into account as well across all the scenarios, particularly to include stormwater, BMP effectiveness over time.

Large group questions and discussion included:

- One participant commented that land conservation could be combined with infill and redevelopment, which could be captured within the rural character scenario.
- Another participant asked about the impacts and consequences of agriculture in future land use?
  - Peter replied that the Agriculture Workgroup is tackling this issue.
- Another participant asked how 'rural' is defined?
  - Peter replied that it's partially defined based on distance to urbanized areas, incorporating data on Census Urbanized Areas.

### **Ranking and Prioritization of Proposed Alternative Future Scenarios**

After the small group presentation of top ideas, Christine asked participants to rank the suggested scenarios using consensus decision-making. The ranking was determined by the observed level of support by participants using a test for consensus decision-making based on the number of fingers participants held up to support ideas (three fingers indicate full support for the proposal or scenario, two fingers indicated support but with some questions or concerns, and one finger indicates too many questions or concerns to be able to support the proposal or scenario).

Results from these rankings of the top scenarios of the small group break outs, which were clarified

and refined with the large group before the test for consensus, are below. Scoring metrics include High +, High, High -, Medium +, Medium, Medium -, Low +, and Low.

1. Combination of Land Conservation & Rural Character: High
2. Infill & Redevelopment: Medium +
3. Future Transportation Corridors & Infrastructure: Medium
4. Climate-Based (change and resilience, considering sea-level rise, long-range planning and buildable areas, and factoring in future shift in population and impacts: Medium +
5. Agriculture/Agricultural Intensity (including foodsheds, shipping of agricultural products, free range and organic food, technology): Medium –
6. Technology and Employment changes: Low +
7. Current Policy + Transportation Corridors + Future Infrastructure: High +
  - a. Note that this scenario accounts for **all** infrastructure, including planned infrastructure, transportation corridors, infrastructure capacity, and infrastructure constraints.
8. Historic plus policy as intended (including infrastructure, planned roads, planned energy development, information (rural broadband), and service areas: High +
9. Rural Character + Land Conservation + Infill and Redevelopment (“**Utopia**” Scenario suggested by DE/MD/D.C. breakout group): High +
  - a. Rural character combined with conservation hybrid (“Utopia” scenario): growth will be redirected to conserve most possible natural resources and rural areas.

Christine reviewed and synthesized the top five prioritized scenarios from the full-group rankings, listed below:

1. Utopia: Combination of #2 – #5 discussed below.
2. Current Policy and All Infrastructure: Current growth management policies and zoning combined with planned transportation and other infrastructure (e.g., sewer and water) improvements and constraints.
3. Conserving and Land and Preserving Rural Character scenarios: Up-zoning suburban/urban areas and down-zoning rural areas combined with aggressive land conservation with the goal of maintaining natural resources and rural open space.
4. Infill and Redevelopment: Added incentives to promote infill and redevelopment.
5. Climate-Based: Restricting development in areas prone to sea-level rise and storm surge.

## **Suggested metrics to consider when evaluating scenarios**

Christine then asked participants to suggest metrics by which to compare or contrast prioritized the future growth scenarios. Suggestions included:

- Results summarizing the acres of forest loss and acres of added impervious land.
- Percent of impervious cover that is developed (with a focus on water quality impact) by small watersheds
- Small watershed outputs
- Wastewater Sector considerations, including infrastructure
- Change in use of BMP’s for redevelopment for sites (for example, for many sites, when they were first developed there were no BMPs)



- Suggestion to potentially use MS4 areas as a metric
- Incentives for watershed coordination that result from certain scenarios
- Per-capita pollutant load considerations: how many acres of impervious land were added per capita, by state?
- Considering forest and farmland fragmentation, as well as large forest patches conversion. This metric would be particularly useful for smaller counties in the watershed.
- Concentration or excess of manure/animal densities is important to consider.
- Recommendation to consider the age of infrastructure for infill/redevelopment scenarios.

Peter then asked participants what spatial scale would be useful to analyze the results.

- One participant noted that results by government/federal/state-owned lands would be useful for jurisdictions to assess what land they have control over.
- The small-watershed scale was also cited as a useful scale.

At the end of the workshop, the large group spent a few minutes discussing the dynamic versus static TMDL decision-making model that is currently under consideration. Then, Mary Gattis and Karl Berger thanked participants for their participation and closed the meeting.

## **Next Steps and Timeline**

Based on feedback from this forum, the Chesapeake Bay Program Office will revise the Historic Trends scenario and simulate a Current Policy scenario that accounts for local zoning data in three ways: excluding areas from growth that are zoned for “conservation”, “open space”, or similar designations; limiting the locations of forecasted residential and commercial growth to areas zoned for these land uses; and weighting the probability surface to favor areas zoned for “planned growth/development”. The Historic Trends scenario will be used in the Current Policy scenario for jurisdictions that did not provide zoning data to the Chesapeake Bay Program Office or provided insufficient data (e.g., over generalized or lacking attribute descriptions). The revised Historic Trends scenario will be available for review in early August and the draft Current Policy scenario will be available for review in mid-August. The forecasts will be available for viewing and download through the Phase 6 Land Use Viewer website. Additional scenarios accounting for more aggressive land conservation, existing and planned infrastructure, upzoning and downzoning, and climate change will be simulated in the fall of 2017 and disseminated through the Phase 6 Land Use Viewer website.