



CHESAPEAKE ENVIRONMENTAL PROTECTION ASSOCIATION, INC.
P.O. Box 117, Galesville, Maryland 20765

NEWSLETTER

Winter 2013-2014

PRESIDENT'S MESSAGE

By Al Tucker, President, 2014



Is Maryland's water supply sustainable? Can it be? Will it be? These questions have been occupying CEPA's 2014 forum committee. The task of finding answers has been anything but easy. At this moment, as we ask about the sustainability of future sources of water, decisions are being made at all levels of government that will affect the future availability of drinking water

within the state. Currently, the statewide focus is on controlling stormwater run-off into the Bay, with little attention being paid to sources of water critical for basic future water needs.

Can it be sustainable? The technology certainly exists to make almost all of our water supply sustainable. One only needs to look at the space station as an example, or at large desalination plants in Arab nations. These solutions may be uneconomical in the long term, but other technologies can achieve the path to sustainability at significantly lower costs.

Will it be sustainable? If people are willing to adapt, change their lifestyles, accept limits on water usage and invest in technologies that increase the efficiency of water distribution and its use, it will be! These changes will have to be more than just water-saving technologies. The move toward Smart Growth is an important first step, but as we shall see later, it could be in conflict with water availability for some communities. Smart Growth areas would be able to enforce demand reduction through the top down planning process. Future scenarios could include water reuse from greywater to complete water recycling.

Sustainability will take the political will of the people to exercise control over the water supply. The State should exercise the doctrine of public trust over water; water should be considered a natural resource and managed for the good of all citizens, not just special interest groups. At the local level, counties rich in open space are fighting the Smart Growth Initiative. Southern Maryland may be the most stressed region in the State and Charles County is the center an epic fight between developers and local citizens. The pro-development commissioners approved zoning changes that would gut the

amount of land for rural/agriculture (tier 4 land) to eight percent (8%). Public outcry forced the commissioners to retreat slightly and to form a committee to make recommendations. Any retreat from previous commitments to preserve open space will be defeat. In the past, Charles County has petitioned the Washington Suburban Sanitary Commission for more water. Currently, that county is testing its deepest aquifer for more water; initial results seem to indicate that pumping from this aquifer may not be a long-term solution. Other options, including reverse osmosis desalination plants on the Potomac have been considered.

Should we, the public, be concerned? CEPA believes the answer is yes! We are particularly concerned about two factors limiting future water supplies, namely:

- Population growth
- Climate change

These factors will impact people differently in various geographic regions of Maryland. Maryland is often described as America in miniature, having mountains, piedmont, coastal plains and seaside. In these areas, communities, acting independently, will seek solutions that will be expensive and not necessarily in common with other communities. They will compete with each other for political influence and for scarce financial resources.

The population of Maryland will grow about 10% by 2030 to 6.7 million people. Without the impact of climate change, one could reasonably expect statewide water supplies to be adequate on the average. But that is the crux of the problem, the average. Various regions of the state will respond differently either to lack of rain or to population growth. Either we will have to use less water per person or find new sources of water to accommodate the increase in population.

The future variability of rainfall and its geographic distribution are unknown. Droughts in Maryland often do not occur uniformly across the state. Severe droughts move around the region during a dry season, so that only some regions experience a dangerous lack of water, while the remaining regions are just dry. Modeling of climate change can tell us something about the expected changes in the average, but not where and when a dangerous lack of water will occur.

Basic Facts about Water Sources & Consumption in MD

To gain some insight into these issues, let's review where Maryland gets its water and how it's used. Maryland obtains its water from two fundamental sources: surface water and groundwater. Surface water serves about 83% of the state's needs while groundwater serves only about 17%.

Surface water, collected in the mountains of Maryland, Virginia, West Virginia and Pennsylvania, serves mostly the
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state's urban regions, the DC metro counties and Baltimore County. These counties account for more than 90% of the surface water consumption used for domestic purposes. Surface water availability depends critically on annual rainfall and snow pack in the mountains. Reservoir systems capture excess flow to store water for dry spells that often occur in summer months. The reservoirs not only maintain water for domestic use, but also play an important role in maintaining river flows to sustain aquatic life that supports the food web for the Chesapeake Bay.

Groundwater sources are divided geographically into two classes. In the piedmont and mountain regions, the underlying geology consists mainly of fractured rock. Water is stored in the rock's interstices. In mountainous areas water flows quite rapidly, forming underground streams that emerge as springs or directly into rivers. People living in these areas normally drill wells to tap these supplies. Since water flows constantly in fractured rock, its groundwater levels depend critically on rainfall and melting snowpack for recharge. In essence the fractured rock area acts like a reservoir. In fact, in the mountain region, it is the reservoir system.

Groundwater extraction in the coastal plain (defined roughly as the land east of the fall line) is a different story. The water in confined aquifers was trapped there up to millions or hundreds of millions of years ago. Although these aquifers have recharge areas that surface just east of the fall line, the water flow is so slow that water taken from them cannot be replenished at a rate equal to what is being consumed now. Some of these aquifers, like the Aquia in Southern Maryland, have been lowered to a level that is close to where water for current users may have to be limited. New wells in this area are drilled into deeper aquifers, such as the Magothy, but the water quality in deeper aquifers is poorer, and replenishment is even slower. Deeper aquifers require more energy to pump and more effort to make the water potable. Further costs are incurred for storage and disposal of treatment chemicals. Essentially, water in these aquifers are irreplaceable.

Growth

How will growth impact these water supplies? The answer can be estimated more reliably for those regions that depend on surface water than those in the coastal plain or the piedmont. Based on past weather scenarios, the major public water supply systems can forecast demand to see the impact of expected growth in their regions. On the average these regions estimate they will have adequate supplies, except in periods of extended drought. Experience during the extended drought period of 1998 – 2002 shows that reservoirs can run dry, and that management of the reserves can be difficult.

Understanding how growth will impact water supplies in the Piedmont will present a challenge to planners. Here, people don't have the advantage of the mountain watersheds, where large open spaces can capture rainfall to supply far fewer people. On the Piedmont, residents are dependent on the amount of water directly below the surface. Consequently the Maryland Department of the Environment (MDE) limits the groundwater consumption of a landowner through a complex formula based on the average annual amount of water recharged by annual precipitation. In dry periods, the average rainfall can support only one to two dwelling units per acre. The Smart Growth Initiative, however, recommends dwelling densities greater than three and half (3.5) units per acre.

Increasing dwelling density presents a conundrum to communities seeking to ensure adequate supplies for future growth. Hence, for communities to grow, they will have to seek water rights extending beyond their boundaries.

The coastal plain presents yet a different question: how much water remains? Unfortunately, that question cannot be answered definitively. First and foremost, Maryland does not have either a sufficient number of observation wells or an adequate real-time monitoring program to provide the necessary picture of current water usage. Data from aquifers like the Aquia in Calvert and St. Mary's Counties give a hint of the impact of rapid development. Large cones of depression indicate that water is being removed faster than flow into the aquifer can replenish. When aquifers near saltwater boundaries are over pumped, reduced pressure in the aquifer allows saltwater to backflow into the aquifer and water quality degrades rapidly. Aquifers on Kent Island, Annapolis Neck, and Ocean City now show signs of saltwater intrusion.

Population growth is not the only factor increasing pumping from the coastal plain aquifer. Agricultural irrigation is one of the fastest growing categories of water use in the state. Farmers need to apply water at critical growth periods during the growing seasons, which on average occur in the historically dry time of early summer. In the period May 2012-2013, MDE Water Supply Program issued 727 new and reissued water withdrawal permits; fifty-six percent (56%) were for agriculture. For permits extracting more than 10,000 gallons per day, eighty-three percent (83%) were for agricultural purposes. Of the total of all permits eighty-nine percent (89%) were for groundwater withdrawals instead of surface water appropriations. Again, the impact on aquifers of these large water withdrawals is unknown.

Climate Change

Droughts occur naturally throughout the United States, and Maryland is no exception. Drought databases indicate some Maryland regions experience severe droughts roughly every decade or two. The most recent long-term drought lasted for four years, 1998-2002. Reservoirs in Western Maryland went dry; the DC metro area had severe use restrictions as river managers struggled to maintain flow in the Potomac. Drought does not happen uniformly across the State. Even during the period of 1998-2002, the severity of the drought hopped around the state with not all regions suffering the most severe impacts at the same time.

Climate change brings an added dimension to the complexity of the problem. Climate modeling is not at the stage of being able to predict impacts at regional and local levels. In fact, at this time, it can only give an indication of the averages we might expect as the result of various levels of greenhouse gasses in the atmosphere. For Maryland, the estimates predict greater annual precipitation than the current average. Initially that sounds promising, but most of the increased precipitation will occur in the winter, and summers will be drier on average, with more extreme weather events. Higher temperatures in the summer will lead to higher rates of evaporation from streams and rivers and greater transpiration by plants (That is not to say that animals and humans will not perspire more too.)

Recent studies by the Potomac River Commission indicate that its reservoirs should adequately support the expected growth in the DC Metro area until 2040. Expected climate shifts, however, will stress or overstress the current reservoir system.

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Conclusion

In an era when everyone is looking for an easily understood answer, there is none. Everyone in Maryland will experience restrictions. Some affect people indirectly. For example, a water allocation for a community may be denied and additional homes may not be built. Other restrictions will affect us directly as use restrictions are enforced, and they will compel us to change the way we use water now. Increased water use efficiency will be demanded. Leaky distribution systems will need repair, and water reuse may be necessary.

For the large water supply systems, repairing and upgrading to prevent water leaks will become paramount and extremely costly. The need to store water and regulate flows during dry periods will require sophisticated management strategies. Increasing the size of and building new reservoirs will challenge existing ecosystems. For the Piedmont, the challenges may be especially difficult. Growth will need to be restricted to those developed areas where demand management and efficient water use can be controlled. For the coastal plain, water allocations among the competing uses of domestic, agricultural, commercial, industrial and ecosystem support will lead to contentious discussions. The current negotiations among users on the Colorado River provide a glimpse of what happens among neighbors when the water supplies become limited.

The Maryland Smart Growth Initiative does not take into account the impact of diminished water supplies as it focuses development into the Priority Funding Areas and restricts development in rural areas. The Maryland Department of Planning does require each county to have a water resource plan. These county plans, though, usually have a short-term horizon and often do not account for the cumulative future impacts on the water supply caused by long-term, piecewise development or sprawl. Even more troubling is that these plans are not kept current. The problem is out of sight of the public and thus out of mind.

In Maryland, MDE does not perform long range, statewide water supply planning. The process uses a permit-by-permit review process without regard to the long-term sustainability of water withdrawals. Also, water supply issues are regional and don't follow county boundaries. Only the state could have the resources to monitor and allocate the water supply.

CEPA was a strong advocate for the efforts of the Water Advisory Group (aka "The Wolman Report", see the 2008 CEPA Forum report ¹). However, funding for these efforts, which were eliminated during the economic downturn, have been restored only to minimal but not sufficient levels.

As the concern, raised during the 1998-2002 drought, recedes in our memories, another drought like that one will have far larger economic consequences. Furthermore, the impact of climate change raises the risks and increases the likelihood that a severe drought will occur.

The pathway to a sustainable future water supply will be complex and expensive. The state needs to exercise the doctrine of public trust for water to ensure that all Marylanders have equal access to it now and in the future. It is time to restore the priority for statewide water resource planning and management. The biggest impediment to public understanding is lack of basic information about Maryland's water supply. The problems are real; the consequences are unknown!

The 2014 CEPA forum on future sustainability of Maryland's water supply will explore these issues. We have not set the date, but our expectations are for early May. We hope that you will come and help us set the priorities for advocacy at the local, regional and state levels.

I would like to acknowledge MDE's annual Groundwater report to the state legislature. There you will find more details about the issues facing the state water supply that I have alluded to above. The 2012 report can be found on the web at: http://www.mde.maryland.gov/programs/water/water_supply/source_water_assessment_program/documents/gwreport_2012_final.pdf . The 2013 report should be available shortly

¹ CEPA Forums: <http://www.cepaonline.org/past%20forums.htm>

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WHO IS CONCERNED WITH THE BAY?

Part II

By Bill Klepczynski



Now that the Maryland Legislature is now well into its 2014 session, we should be aware of which legislators are involved with environmental issues and what bills may be passed and become law.

In the House, the **Environmental Matters Committee**, whose chair is Delegate Maggie McIntosh and vice chair is Delegate James E. Malone, Jr., handles a variety of issues including agriculture and agricultural land preservation, natural resources, land use, open space programs, vehicle emissions and lead-paint. These issues are handled within the following four subcommittees: *Agriculture, Agriculture Preservation and Open Space*, whose chair is Rudolph C. Cane; *Environment*, whose chair is Barbara Frush; *Land Use and Ethics*, whose chair is Elizabeth Bobo; and *Natural Resources*, whose chair is Marvin E. Holmes, Jr.

In the Senate, the **Education, Health and Environmental Affairs Committee**, whose chair is Senator Joan Carter Conway and vice chair is Senator Roy P. Dyson, handles issues on natural resources, environment, energy, agricultural use and land preservation. These issues are handled within the *Environment Subcommittee* whose chair is Joan Carter Conway.

This year, the **House has 7 bills** dealing with the environment: two dealing with the Bay Restoration Fund; three with Watershed Protection and the Restoration Program; one with

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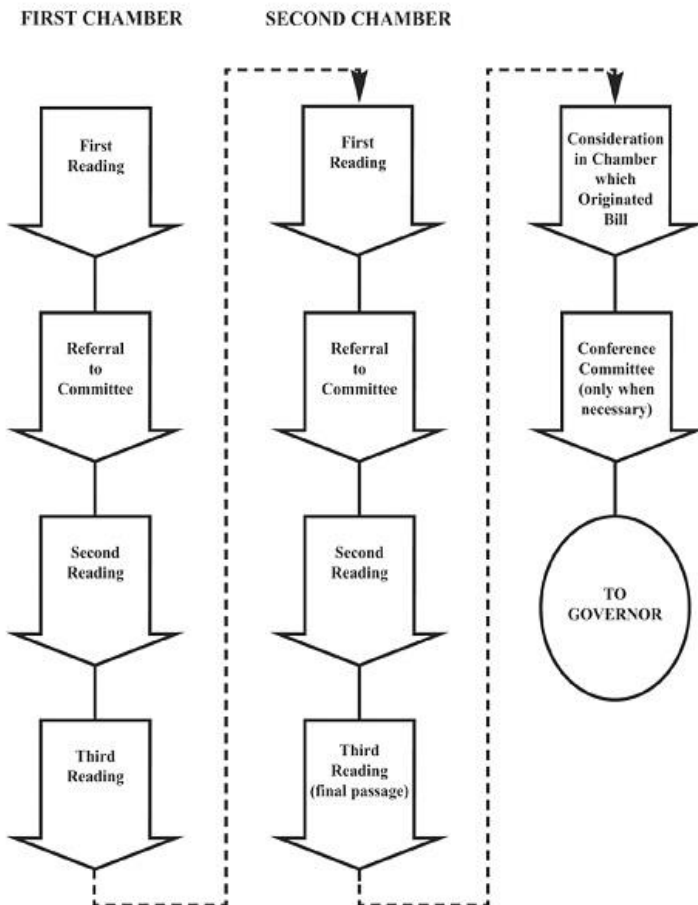
Greenhouse Gas Emission Reduction; and one with Mercury disposal from Dental Amalgams. The **Senate also has 7 bills**: one dealing with the Bay Restoration Fund; two with Watershed Protection and the Restoration Program; one with Solid Waste Management Practices; two dealing with liens on properties with environmental violations; and one with the Drinking Water Revolving Loan Fund. One can get the latest status on these bills by going to the General Assembly of Maryland (GMA) web site

[\[http://mgaleg.maryland.gov/webmgafm1st.aspx?tab=home\]](http://mgaleg.maryland.gov/webmgafm1st.aspx?tab=home) and typing "Environment" in the *Find legislation by broad topic* box at the top of the page.

The process by which a bill becomes law and is signed by the Governor is a lengthy and long process. It is summarized in the figure at the end of this article.

If the bill passes the third reading of the second chamber without any amendments, it becomes goes to the Governor for his signature and to become law. If there is an amendment to the bill in the second chamber, it goes back to the first chamber for consideration. If the amendment is not adopted by the first chamber, the bill then goes to a conference committee to iron out any differences. A conference committee consists of three members of each house, appointed by the Senate President and the House Speaker. The committee sends a report of its recommendations to each chamber which then can either adopt or reject it. If the report is adopted, the bill is voted upon for final passage in each house. If the report is rejected by either house, the bill fails.

The Progress of a Bill



THINKING ABOUT SUSTAINABILITY

By Richard L. Dunn



In a national or societal context, what is "sustainability"? One definition is that a "sustainable society is one that can persist over generations; one that is far-seeing enough, flexible enough, and wise enough not to undermine its physical or its social system of support" (Meadows & Randers, *Beyond the Limits*). Long before the term gained currency, the National Environmental Policy Act (1969) declared that it was the continuing policy of the Federal Government to "create and maintain conditions, under which human and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generations" (42 U.S.C. 4331). This policy statement is also essentially a definition of sustainability.

Someone might ask whether societies don't just perpetuate themselves naturally. Don't nations and societies usually adjust to challenges and persist generation after generation for centuries? Actually, absent major and often disruptive transformations, many do not. Examples of complete implosions - of societies disappearing, are not rare. Jared Diamond's best seller *Collapse* provides examples of societies that did just that, collapsed.

In recent years the National Research Council of the National Academies of Science has issued a pair of reports on sustainability. One is *Sustainability and the U.S. EPA* and the other is *Sustainability for the Nation: Resource Connections and Governance Linkages*. Both these reports indicate that the Government in general and the EPA in particular are poorly organized to comprehensively address sustainability. The implications of these reports also are relevant to the organization and relationships needed in state and local governments.

Sustainability issues are typically complex. Many Government agencies are accustomed to a narrow regulatory focus, issue by issue rather than managing connections and promoting linkages. Key resource domains include water, land, energy, and nonrenewable resources. Categories of users of these resources include nature, industry, agriculture, and domestic needs. According to *Sustainability for the Nation*, a near complete connection exists among all of these domains. Nevertheless, decision makers and scientists typically specialize in one resource domain or one group of resource users and may be relatively unaware of the constraints that may exist because of their area's connections with others.

The National Resource Council reports point to obstacles that undermine agencies' ability to fully consider connections among resource areas and build needed linkages to manage them. Some of the barriers that frustrate government efforts to address sustainability challenges are:

- 1 - The basic legal framework of government results in authority being separated and dispersed. Many of the laws that authorize agencies focus on a single mission or single domain - for example, water or energy - even if the domain is part of an interconnected resource system. Each agency or even sub-agency or bureau focuses on implementing its own statutory mandate. This is the "silo" or "stovepipe" effect.

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2 - Funding mechanisms favor short-term, single-agency initiatives rather than longer term, cross agency projects. Budgets are promulgated on an agency by agency basis. Agencies typically promote and defend their own initiatives rather than multiagency initiatives. The congressional appropriation committees and process fosters this approach.

3 - There is lack of access to or coordination of foundational elements such as research and information/data. One of the consequences of the silo effect is that agencies have traditionally compiled the data they need or have undertaken research for activities they view as their own, independent of fellow agencies. Similar fragmentation often happens with basic and applied research. There is some coordination among agencies in research portfolios and in making results available; agencies, however, generally undertake research within their silos, tailored to their own needs and programs.

4 - The culture of government tends to encourage agencies and their personnel to stay in their "lanes" and avoid getting involved in fellow agency activities. Rather than encouraging collaboration or risk-taking, agency culture tends to offer recognition, promotion, and other rewards based on an employee advancing an agency's agenda.

With respect specifically to the EPA, the National Resource Council report made a number of recommendations relating to creating an operational framework for sustainability at EPA, identifying scientific and analytical tools to support the framework, incorporating a risk assessment/risk management paradigm integrated into the sustainability framework and identifying the expertise needed to support an operational framework for sustainability. Details supporting the recommended approach are described in the report. This will require culture change at EPA. Recommendations relating to EPA culture are:

- 1 - Foster change and innovation at all levels of EPA;
- 2 - Learn from others and from what is going on at EPA;
- 3 - Broaden disciplinary approaches toward understanding underlying processes; and
- 4 - Consider longer term time horizons.

Thinking about sustainability may be an incentive to think about other needed changes in culture and approaches to problems. Either/or approaches may be less than optimal, even self-defeating. For example, debates about the need for regulation versus market based solutions may miss the point. Rather it may be that the more productive discussion is how regulation can fill gaps left by the market and empower market based solutions. In fulfilling a statutory policy goal, where might regulation be essential? Where might a market based solution be more effective? How can these be coordinated? Absent development of linkages and connections as recommended in the National Research Council report, governments are likely to remain weak in crafting an effective framework for sustainability. In addition to changes in agency culture at national, state, and local levels, legislative bodies at those levels may need to rethink their organization and processes. Means to increase cooperation between levels of government and between public and private sectors are also needed.

This article does not purport to outline a solution or provide a simple answer to complex problems. It is a modest attempt to suggest that sustainability and its implications outline a framework around which to consider approaches to addressing issues related to the health and viability of the Chesapeake

region generally and its environment in particular. Local initiatives may provide models for adaptation to broader regional and national approaches. Those interested in considering the concept of sustainability in greater depth may refer to the reports and book mentioned in this article. A more comprehensive and profound way to look at sustainability may be found in *A National Strategic Narrative* (<http://nationalstrategicnarrative.org/read/document>).

PUBLIC ACCESS TO THE PUBLIC WATERWAYS

By Mike Lofton



The old sage Bill Burton said it best, *"How can vital citizen support come about to save the Chesapeake without access to it? People must have a taste of the Bay before they are willing to fight and sacrifice for its well-being."* I'm not sure when Bill first made this astute observation but I

read it in a *Bay Weekly* article about 10 years ago. It's a timeless truth. People take care of things that are important to them; that they are proud of; things that they love. I am convinced that a significant element in our failure to "clean-up" the Chesapeake is the relatively small number of us that have that personal passionate relationship with the Bay that Mr. Burton described.

Simply put, citizens need abundant, convenient and varied access to the Chesapeake. We have a lot of improving to do. Bay-wide the National Park Service estimates the public has access to about 2% of the shoreline. In Anne Arundel County the situation is no better. Shockingly, with more than 500 miles of shoreline, Anne Arundel County offers its citizens not a single public boat ramp or a single public beach. Thankfully, the State of Maryland provides boat ramps and beaches at Sandy Pt. State Park. However, the park often fills by mid-morning on summer weekends and Rt. 50 at the Bay Bridge is often a problem. The City of Annapolis has a boat ramp at Truxton Park.

There is hope! A first-ever County ramp is in the works at Ft. Smallwood Park in North County. The County Rec & Parks Department has addressed the problem head-on in its new Plan for Public Recreation and has adopted the recommendations of a citizen Water Access Committee to create public access on both shorelines of every major river in the County.

Change is happening in South County as well. A new 65 acre waterfront Park is open at Jack Creek in Shadyside. Significant efforts are underway to open the long unused Franklin Point State Park in South County. Unnecessary permit requirements for access to Beverly-Triton Beach Park have been removed.

Take a look at a new interactive map to discover existing & potential access points, <https://mapsengine.google.com/map/u/0/embed?mid=zd5StXLeFOcg.kVnj9hDuXR1U>

If you have questions or ideas or would like to participate, please contact Mike Lofton m149@aol.com



**PROFILE OF A TRUSTEE
Albert Tucker**

Al has been a member of CEPA since 2008 and now serves as president of the CEPA Board of Trustees. He lives on a farm in "South County" in Lothian, Maryland with his wife, three wild, now domesticated cats, and two hives of bees. Al is a certified Maryland farmer who actively supports the state's nutrient management initiatives to protect the Bay.

In 1971 the preservation of Jug Bay was Al's initiation into the activism needed to preserve natural areas. Currently, he serves as vice president of The Friends of Jug Bay. The Jug Bay area now encompasses several thousand acres of preserved natural area.

As a youngster, Al developed his love of the land and environment on a small family farm in New England. However, the call of higher education and science lured him away. He graduated from the University of Massachusetts with a major in physics. Continuing his interest in classical physics, he received an M.S. in engineering mechanics from Penn State. Working for the Navy, he became interested in acoustics and received a Ph.D. from Catholic University. Al spent most of his career working in various science and technology positions for the U.S Navy, DARPA and the Department of Defense.

Upon retiring from the Office of Naval Research, Al returned to his first interest of living on "the farm" where he comes face to face with nature every day. Al says, "living on a farm you see just how fragile Maryland's land is and, hence, the need to protect and preserve it."



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