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via@vaforestry.org

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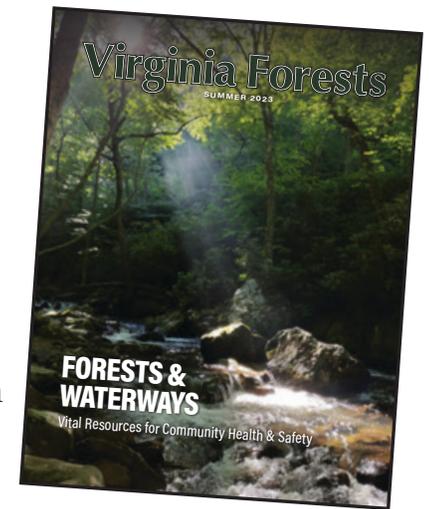
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On the trail to Cascade Falls, September 2018. (PHOTO BY QIFAN YANG PROVIDED COURTESY OF THE VIRGINIA WATER RESOURCES RESEARCH CENTER AT VIRGINIA TECH)

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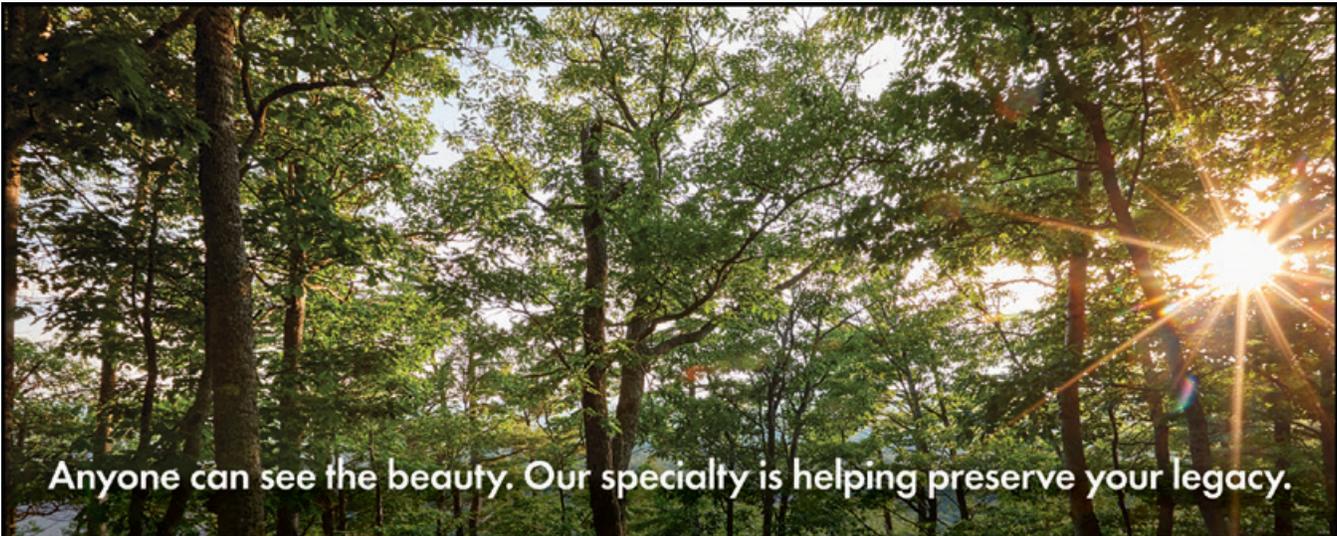
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My Real Forest Conversation with Artificial Intelligence

June was an incredibly busy month for me, both personally and professionally. Moving to a new home, college visits with my oldest child, political fundraisers, regulatory workgroups, organizing our new Councils and Committees, and so on. I was uncharacteristically stymied for an idea for this installment of my column. That was, until I was going through the clips for the *VFA Voice* and came across the publication of a conversation between an environmental advocate and one of the new artificial intelligence bots.



Corey Connors

I had to see what all the buzz was about for myself (and for you), so logged in for my very first forestry chat with a robot. I have not edited the questions or responses below in any way. Some responses required multiple submissions of the same question due to networking traffic errors. Apparently, ChatGPT has become popular very quickly.

On July 13, 2023 at 10:05 AM, after filling in the required information, I conducted the following dialogue with ChatGPT. The conversation ended at 10:52 AM.

ME: Explain the importance of maintaining healthy forests in simple terms.

ChatGPT: Maintaining healthy forests is really important for a few key reasons. Let me explain them to you in simple terms:

- **Clean Air:** Forests act as the lungs of the Earth. They absorb carbon dioxide, which is a harmful gas that contributes to climate change, and release oxygen, which is what we humans and other animals need to breathe. So, healthy forests help keep the air clean and fresh.
- **Biodiversity:** Forests are home to countless plants, animals, and insects. They provide habitats for a wide variety of species, including some that are rare and endangered. By preserving forests, we protect the diverse life forms that depend on them, ensuring the survival of different plants and animals.
- **Water Cycle:** Forests play a crucial role in the water

cycle. They act like sponges, absorbing rainwater and gradually releasing it into streams, rivers, and underground reservoirs. This helps regulate water flow, prevents flooding, and ensures a steady supply of water for people, animals, and plants living downstream.

- **Soil Conservation:** Forests help prevent soil erosion. The tree roots hold the soil in place, preventing it from being washed away by heavy rain or blown away by strong winds. This is important because soil erosion can lead to barren lands and make it difficult for plants to grow, affecting agriculture and the overall health of ecosystems.
- **Climate Regulation:** Healthy forests also have a cooling effect on the planet. They provide shade and reduce the amount of heat absorbed by the Earth's surface. Forests can also help regulate local climates by influencing rainfall patterns and maintaining humidity levels.

Overall, maintaining healthy forests is vital for the well-being of the planet and all living beings. They support clean air, diverse ecosystems, clean water, stable soil, and a balanced climate. It's essential to protect and preserve forests to ensure a sustainable and healthy environment for ourselves and future generations.

ME: What percentage of Virginia's forests are privately owned?

ChatGPT: As of my knowledge cutoff in September 2021, approximately 80% of Virginia's forests are privately owned. This means that the majority of forests in the state are under the ownership of individuals, families, or organizations rather than being publicly owned or managed by the government. However, please note that this information may have changed since then, and it's always a good idea to consult updated sources or official data for the most current information.

ME: How much does it cost for private forest landowners to maintain healthy forests?

ChatGPT: The cost of maintaining healthy forests for private landowners can vary widely depending on various factors such as the size of the forest, its condition, specific management goals, and the region in which it is located. Here are some common expenses that private forest landowners may incur:

1. **Forest Management Plans:** Developing a comprehensive forest management plan can involve costs for hiring a professional forester or consultant to assess the forest's condition, determine management objectives, and create a long-term plan. The cost of such services can vary based on the size and complexity of the forest.
2. **Forest Regeneration:** If a landowner intends to regenerate or replant portions of their forest, there will be costs associated with purchasing tree seedlings, site preparation (such as clearing brush or tilling the soil), and planting the seedlings.
3. **Forest Health and Pest Management:** Maintaining forest health involves monitoring for pests and diseases, conducting necessary treatments, and implementing preventive measures. These activities may include insecticide or herbicide applications, prescribed burning, or the hiring of pest management professionals, which can incur costs.
4. **Timber Harvesting:** If a landowner decides to harvest timber as part of sustainable forest management, there will be expenses related to logging operations, such as hiring a logging crew, equipment rental, transportation, and ensuring compliance with logging regulations.
5. **Firebreaks and Fire Management:** Creating firebreaks and implementing fire management practices to prevent and control wildfires may involve costs for constructing firebreaks, acquiring firefighting equipment, and training personnel.
6. **Property Taxes:** Private forest landowners are typically responsible for paying property taxes on their forested land, although tax incentives or programs may be available in some areas to promote forest conservation.

It is essential for private landowners to consult with local forestry experts, extension offices, or professional foresters who can provide specific cost estimates and guidance tailored to their individual forest management goals and circumstances.

ME: How can private forest landowners generate the income necessary to cover the costs of healthy forest management?

ChatGPT: Private forest landowners have several options to generate income to cover the costs of healthy forest management. Here are a few common strategies:

1. **Timber Harvesting:** Sustainable timber harvesting is a way to generate income from forests. By working with a professional forester or consulting a logging company, landowners can selectively harvest mature trees and sell them as timber. This requires careful planning and adherence to sustainable forestry practices to ensure the long-term health and productivity of the forest.
2. **Non-Timber Forest Products:** Private landowners can explore the potential of non-timber forest products (NTFPs) to generate income. NTFPs include items like

mushrooms, berries, medicinal plants, decorative foliage, and floral greens. Landowners can sustainably harvest and sell these products, either directly to consumers or through established markets.

3. **Hunting and Recreation Leases:** Depending on the location and characteristics of the forest, landowners may consider leasing their property for hunting, fishing, camping, or other recreational activities. These leases can provide a consistent source of income while allowing people to enjoy the natural beauty of the forest.
4. **Conservation Easements and Carbon Credits:** Private landowners can explore options such as conservation easements, which involve entering into agreements with conservation organizations or government entities to protect their forested land in perpetuity. In some cases, landowners may receive financial compensation or tax benefits for restricting future development or practicing sustainable forestry. Additionally, carbon offset programs offer opportunities for landowners to generate income by sequestering carbon dioxide through sustainable forest management practices and selling carbon credits.
5. **Agroforestry or Agroecotourism:** Landowners can integrate forestry with agriculture or tourism. Agroforestry involves combining tree cultivation with agricultural crops or livestock production to diversify income streams. Agroecotourism offers opportunities for landowners to open their forests to visitors, offering activities such as nature tours, camping, educational programs, or farm stays.
6. **Government Assistance and Cost-Share Programs:** Various government agencies and conservation organizations provide financial assistance, grants, or cost-share programs to support forest management efforts. These programs can help offset some of the costs associated with maintaining healthy forests.

It's important for private landowners to research and consult with forestry professionals, extension offices, or local agricultural agencies to identify the most suitable income-generation strategies based on their specific forest characteristics, market conditions, and personal goals.

ME: Doesn't select harvesting negatively impact forest health?

ChatGPT: Selective harvesting, when conducted sustainably and with proper planning, does not necessarily have a negative impact on forest health. In fact, selective harvesting can be an important component of responsible forest management and can promote the long-term health and productivity of forests. Here's why:

1. **Biodiversity Conservation:** Selective harvesting allows for the removal of specific trees while leaving others behind. This approach helps maintain the overall biodiversity of the forest by creating openings for new tree growth,

promoting the development of different tree species, and providing varied habitats for wildlife.

- 2. Regeneration and Growth:** By selectively harvesting mature or overstocked trees, landowners can create space and resources for the growth and regeneration of younger trees. This promotes a healthy age-class distribution within the forest, ensuring a continuous cycle of forest growth and renewal.
- 3. Forest Structure and Resilience:** Selective harvesting helps create a diverse forest structure with trees of varying ages, sizes, and species. This diversity enhances the resilience of the forest ecosystem, making it more capable of withstanding disturbances such as pests, diseases, storms, or climate change impacts.
- 4. Light and Nutrient Availability:** Selective harvesting opens up the canopy, allowing more sunlight to reach the forest floor. This increased light availability stimulates the growth of understory plants, which are important for biodiversity and provide food and habitat for various species. Additionally, selective harvesting can improve nutrient cycling by redistributing nutrients from harvested trees to the remaining vegetation.
- 5. Carbon Sequestration:** While tree removal through selective harvesting does release some carbon stored in the harvested trees, sustainable forest management practices can ensure that the overall carbon balance remains positive. By promoting forest regeneration and growth, selectively harvested forests continue to sequester carbon over time, contributing to climate change mitigation efforts.

It's important to note that responsible selective harvesting practices should be guided by sustainable forestry principles, local regulations, and the expertise of professional foresters. Proper planning, careful tree selection, and adherence to best management practices are essential to minimize negative impacts and promote the long-term health and productivity of forests.

ME: Where can I find forestry professionals in Virginia?

ChatGPT: To find forestry professionals in Virginia, you can consider the following resources:

- 1. Virginia Department of Forestry:** The Virginia Department of Forestry (VDOF) is a valuable resource for forestry-related information and assistance. They can provide guidance on forest management, connect you with local forestry professionals, and offer information on programs and services available in the state. Visit their website at <https://www.dof.virginia.gov/> to access their resources and contact information.
- 2. Consulting Foresters:** Consulting foresters are private professionals who offer expertise in forest management, timber sales, and other forestry-related services. They can provide personalized guidance tailored to your specific needs. The Virginia Forestry Association



maintains a directory of consulting foresters on their website: <https://www.vaforestry.org/find-a-forester>

- 3. Local Cooperative Extension Offices:** Cooperative Extension offices, affiliated with universities, often have forestry and natural resources specialists who can provide guidance and connect you with local resources. The Virginia Cooperative Extension website (<https://ext.vt.edu/>) allows you to search for your local office and find contact information for their forestry experts.
- 4. Professional Associations:** Professional forestry associations can be a valuable resource for finding forestry professionals. The Virginia Forestry Association (<https://www.vaforestry.org/>) and the Society of American Foresters (<https://www.eforester.org/>) are examples of organizations that can provide information, networking opportunities, and access to forestry professionals in the state.

When reaching out to forestry professionals, it's important to discuss your specific needs and expectations, and ask about their qualifications, experience, and certifications. This will help ensure that you find the right professional who can provide the expertise and services you require for your forest management goals.

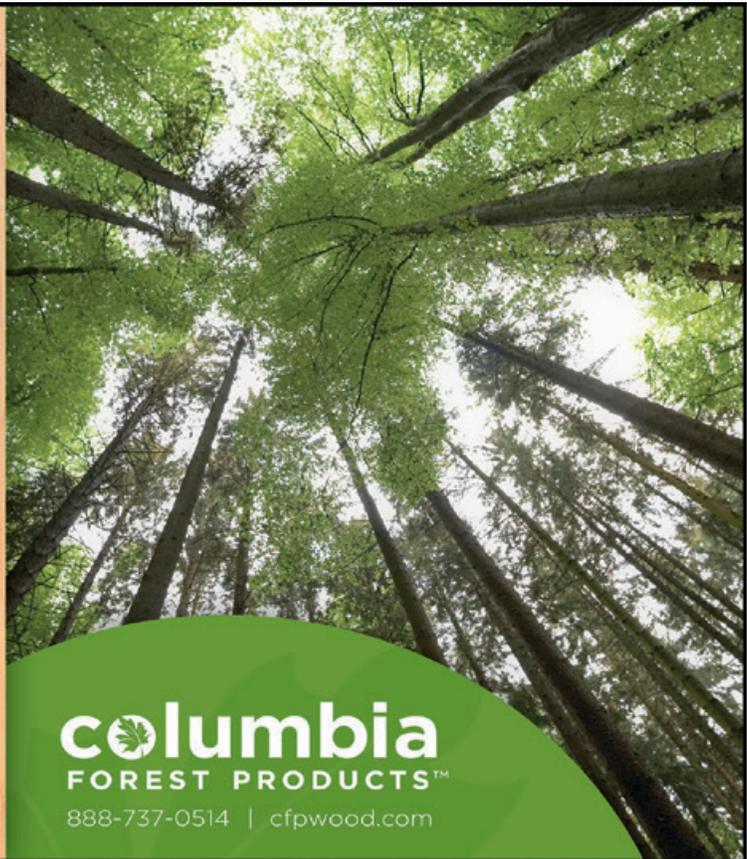
My review of ChatGPT:

The system was a little glitchy. Some of the incomplete answers provided by the system, though fundamentally similar, had minor differences from the completed answers above. The disclaimer that not all information may be accurate was also true as the VFA resource they provided for finding a forester did not exist at that time (though it does now ... check out the link for our new Resource Guide!).

All in all, for those who struggle with writing, I can see where something like ChatGPT can be utilized as a tool in providing a foundation to communicate more effectively. The responses are relatively well-informed (though need to be fact-checked) and comprehensive. I can recommend giving it a try if you are so inclined. 🗨️

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Future Careers in Forestry are Built by Today's Leaders

When thinking about a topic to cover for this summer's issue, I reached out for some suggestions. Someone suggested writing about my military experience and how that relates to how I run my business today. Yes, this does have a huge impact on how I conduct myself daily in dealing with the challenges of owning a logging company. Decision making, teamwork and mission accomplishment all come naturally from that experience. But, ultimately, how I conduct myself in this profession has been greatly influenced by those I worked for early on in my career.



Dan Hockenberger

Frank Brooks of Forest Resources Management, Inc. (FRM) was my first boss in Virginia in 1995 when I came from SUNY ESF Ranger School to work as a Forestry Technician. I learned a great deal from him and use those lessons every day. Relative to the stories in this issue of the magazine, Frank was a stickler when it came to best management practices (BMPs), particularly water bars and rolling dips. I put down many pounds of seed and straw while working with the loggers to close out tracts. One of my first continuing education experiences was a Sharp Logger BMP class in Fredericksburg with Matt Poirot, who wrote the BMP manual we use today.

In the early days at FRM we used CAD (Computer Aided Design and Drafting). That was high tech for the time. We were among the first consulting firms to use GPS units. We uploaded corrections from a dial-up network, which was like watching paint dry. We eventually got TwoDog Forest Inventory software and, over time, much more. We were always challenged by new technology. I remember Frank had a quote framed on the wall behind his desk that read: "The past is a foreign country; they do things differently there."

These are just a couple of examples of how Frank impacted me. Our drives to timber cruise projects, timber sales, or a prescribed burn were full of forestry related conversations, such as Latin names for various tree species and the best paint color to use for marking out a timber sale area, not to mention figuring out how many plots to take on a particular cruise to reach our desired confidence interval. You could not sleep on the ride or you would get the you-know-what scared out of you with a brake tap and strike of the horn. Most importantly, when we got to the woods, he worked just as hard as any of us.

Eventually we all may find ourselves in a position of leadership where we have a young person fresh in our field working beside us. It is refreshing when that person cares as much as you do about the job. This is the person that you need to invest in. I have had the same young man working for me since 2014. Born into a logging family, he is a natural at his craft. He is smart, a thinker, a listener, and a communicator. This is someone I don't mind investing in. I'm sure we all have had a young coworker or employee we invested time and

—continued on page 28

Coastal Forests and Marshes Help Communities as Flooding Increases

By Molly Mitchell, Sarah Stafford, and Pamela Mason

Flooding is becoming an increasing concern for Virginians. Sea level is rising, and rain is becoming more intense. Storms, like hurricanes and nor'easters, bring both high tides and heavy rain, compounding flooding issues. Development has also changed our landscape and eliminated some of the natural systems that could help mitigate flooding. As flooding and flood impacts increase, understanding and predicting changing conditions becomes more important. The AdaptVA.org website is one way that people, planners, and managers can monitor the anticipated trajectory of change and understand the consequences of those changes.

Sea Level Rise in Virginia

Sea level is rising faster in Virginia than anywhere else along the Atlantic coast due to a complex interaction of increasing ocean water levels, sinking land, and changing ocean circulation patterns. The acceleration in sea level rise in the past couple of decades means that floods, which occurred only every few years throughout much of the 1900s, now occur multiple times a year. This change was not anticipated when we were building infrastructure (houses, roads, septic systems, etc.) during the 1920s–1980s and that infrastructure in our coastal and riverine floodplains is rapidly becoming vulnerable to flooding. To understand how rapidly that threat will grow in the future requires examination of historic water levels and projections of the patterns of rise.

The Virginia Institute of Marine Science monitors sea level rise along

the continental United States in their annual “Sea-Level Report Cards.” For Virginia, these report cards show a projected future rise in mean sea level of approximately 1.5 ft. by 2050, relative to our current mean sea level (as defined by the National Oceanic and Atmospheric Administration). That may not seem like a lot of extra water, but much of our coastal plain is very flat, low-lying land, so small increases in water levels can flood large swaths of land, putting people and homes at risk.

At AdaptVA.org, you can explore the impact of different flood levels on coastal infrastructure. Using the interactive tool, you can see that the land flooded twice daily at high tide increases slowly up to about 2050–2060 and then increases more rapidly as sea level rise continues to accelerate. Increased daily flooding means that we will see more road segments being



Dead trees and a marsh encroaching on a gravel road are indicators that this road floods during storm events and eventually will be covered by daily high tides.

cut-off during high tides, which can cause traffic delays or even trap people in their neighborhoods until the waters go down. The locality road flooding tool shows which roadways will be cut-off from the county seat at different water levels. Rural roads, which have limited alternate routes to many homes, are particularly vulnerable to losing access under flooding. However, flooding on urban roads tends to impact many more people. Other tools on the site highlight the location of floodplains and areas with hot spots of septic system repair needs. Although there are many causes of septic system failure, rising groundwater, driven by sea level rise, is an emerging concern in low-lying coastal areas. These maps highlight areas where alternate strategies for dealing with wastewater may need to be considered. Maps can also show where our existing natural resources (forests, marshes, etc.) are and how they might be impacted by rising water levels.

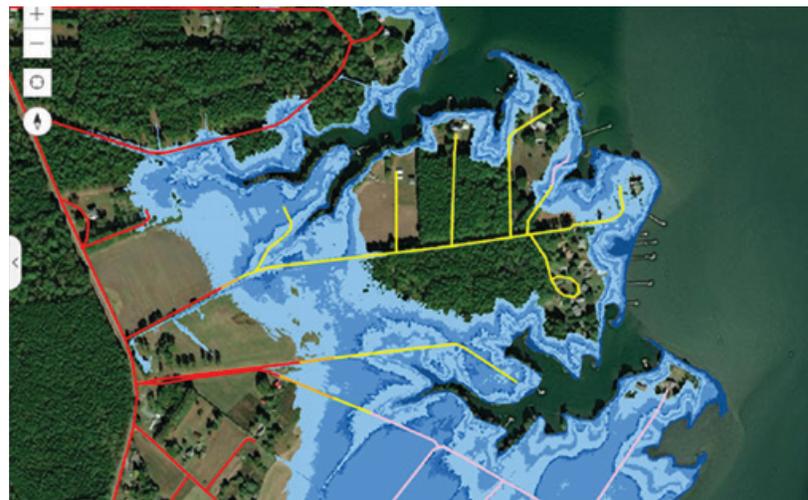
Impacts to Our Communities

Some individuals such as the poor, elderly, and disabled and are at much greater risk to natural disasters such as flooding and hurricanes than the general public. Social vulnerability is the term used to describe situations where individuals or groups are less able to respond to, recover from, or adapt to natural or man-made hazards. Individuals who are socially vulnerable are less resilient to hazards and typically face disproportionate losses from them.

Social vulnerability is context-specific, since the characteristics that might make someone socially



The AdaptVA.org Locality Road Flood Tool shows which roads will become inaccessible at different water levels.



vulnerable in one location may not make someone vulnerable in another, and an individual may be vulnerable to one particular hazard but not to another. With respect to sea level rise in Virginia, some of the characteristics that make individuals socially vulnerable are poverty, age (both being elderly or being very young), disability, living alone, being a minority or a non-English speaker, or being undocumented. As localities work on adaptation strategies and mitigation plans for sea level rise, it is important to make sure that those plans take into account not only sea level rise, but also social vulnerability to natural hazards. With AdaptVA, you can explore the social vulnerability of different areas in coastal Virginia based on both a social vulnerability index and a social vulnerability classification.

Sea level rise and the natural hazards that accompany it will also have impacts on the local economy and government, and not all economies or governments are equally prepared to recover from or adapt to natural hazards. Local economies may be vulnerable to sea level rise for many reasons including a lack of economic diversity, dependence on sectors that are likely to be most affected by sea level rise (retail trade, tourism, leisure-oriented or land-dependent businesses), a high percentage of small businesses or self-employed individuals

that have lower capacity to deal natural hazards, and declining economic conditions.

Local governments can also have a difficult time recovering or adapting when they have a low net worth per citizen, already spend a large percentage of their budget on health and welfare, rely on tourism or property taxes for a large percentage of their revenues, or when they have a lot of physical assets at risk and little money to repair them if they are damaged.

How Do We Adapt?

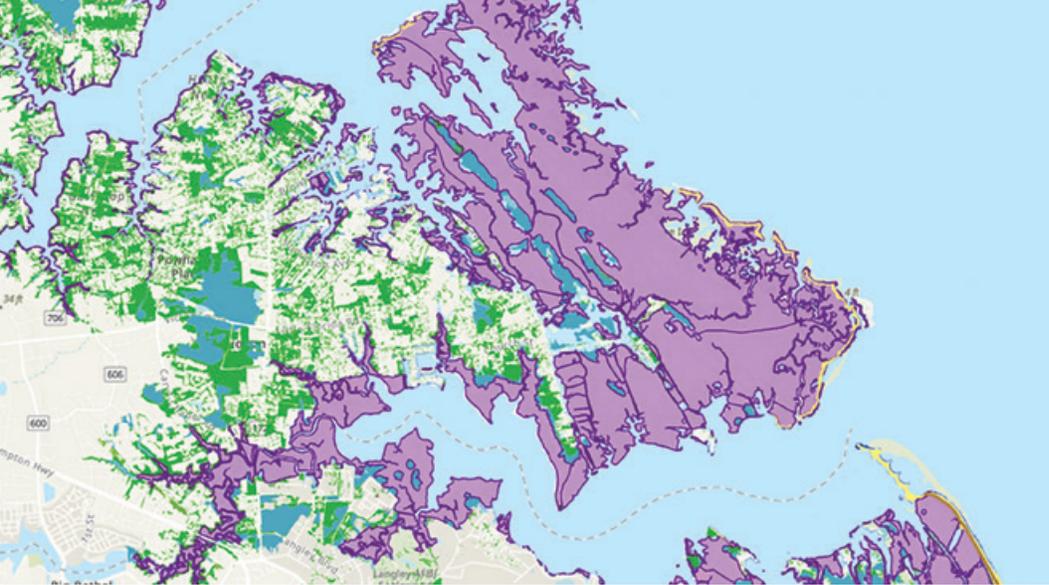
Of the many options to adapt to our changing climate, and sea level rise and flooding in particular, the protection of existing natural features is important for resilience. Where natural features no longer exist, nature-based features (NBF) can be added. NBFs are habitats such as forest, riparian forest buffers, nontidal and tidal wetlands, beaches, and dunes. These features provide multiple benefits for water quality, aquatic and terrestrial habitat, flood water infiltration, erosion protection, recreation, aesthetics, public health, and more. In some situations these benefits could also be provided via hard-engineered features, such as lined stormwater channels in the case of water quality or sea walls in the instance of shoreline erosion control; however, NBFs are less likely to adversely impact the environment

and are frequently less expensive to install and maintain.

Recent research has focused on the role of NBFs in climate resilience. Forest buffers and wetlands provide for flood water infiltration and evapotranspiration which can reduce the adverse impacts of flooding and rising groundwater levels. They also reduce erosion of shorelines and stabilize stream and creek banks. Forested buffers have been shown to have a significant cooling effect on adjacent waterways, and forested areas can have as much as 10-degree lower temperatures under canopy. In addition, green spaces in urban areas have proven to be associated with decreases in crime and overall improvement in human health metrics. Trees also mitigate greenhouse gasses by converting carbon dioxide (CO₂) into organic matter, helping to slow global temperature rise.



Flooding on this urban road at a high fall tide disrupts the morning commute and comes close to the foundation of the houses.



The AdaptVA.org Interactive Map shows NBFs overlaying a projected sea level for 2050.

Several incentive programs that reflect the ecosystem services afforded by NBF are in place in Virginia. Perhaps most notable is that forested buffers and tidal and non-tidal wetlands are approved water quality best management practices for the Chesapeake Bay Program. As such, implementation of these practices can produce nutrient and sediment load reduction credits. NBF are also acknowledged as beneficial practices for flood benefits by the Federal Emergency Management Agency (FEMA), for aquatic living resources support by the National Oceanic and Atmospheric Administration (NOAA) and for erosion control by Federal Highways Administration (FHA). These, along with other federal, state and regional entities, provide opportunities to build partnerships for planning, design, and implementation of nature-based features.

Virginia, as a partner in the Chesapeake Bay Program, has agreed to shared outcomes on the implementation of several NBFs including forested riparian buffers and wetlands (tidal and nontidal inclusive). Unfortunately, both of these outcomes have been determined to be off-track for achievement by the goal date of 2025. However, this determination has led to an increased focus on forest buffers and wetlands.

Summary

Natural and created NBFs provide multiple ecosystem services that benefit communities in Virginia. Focusing on trees and wetlands, including forested wetlands, these features provide flood mitigation, terrestrial and aquatic habitat, and climate moderation with greenhouse gas reduction and carbon storage. Forests are notable for also providing temperature reduction for human and animal habitat and physical and mental human health benefits. There are historic levels of funding available for planning and implementation for NBFs. Given the multiple benefits provided by NBF that are mission-driven outcomes for state, federal and regional partners and the unprecedented funding opportunities, now is time to collaborate on NBF projects that will provide many benefits, notably flood mitigation, to Virginia communities. 🗨️

Molly Mitchell is an assistant professor in the research program at Virginia Institute of Marine Science's Center for Coastal Resources Management (CCRM). Her research interests focus on shifts in coastal resources due to the interaction of sea level rise and human-driven changes.

Sarah Stafford is CSX Professor of Economics and Public Policy in the Department of Economics at William and Mary. She received her B.S. in Foreign Service from Georgetown University in 1990 and her Ph.D. in Economics from the Johns Hopkins University in 1998.

Pamela Mason is senior marine scientist and CCRM Extension manager at the Virginia Institute of Marine Science.

Multiple Benefits of Nature-Based Features



Flood risk reduction for coastal buildings:
Natural features

intercept and reduce the energy of rainfall, storm surge and tidal flooding. Floodwaters are stored and slowly released by trees and wetlands.



Flood insurance:
Protecting and restoring natural features can earn

credits for reduced insurance premiums through the National Flood Insurance Program's Community Rating System.



Water quality improvement:

Forests, trees, and wetlands effectively filter air pollution and remove excess nitrogen and phosphorus, and also capture sediment in stormwater runoff and tidal floodwaters.



Floodplain restoration:

Natural floodplains store floodwaters, filter pollution, and provide habitat. Floodplain restoration reestablishes a more natural hydro-logic regime that connects wetlands, waterways and adjacent land. 🗨️

- from Virginia Institute of Marine Science CCRM Research (https://www.vims.edu/ccrm/research/climate_change/adaptation/nbfs/index.php)



Forested wetlands of the City of Virginia Beach. (PHOTO COURTESY OF G. FLEMING, VIRGINIA DEPT. OF CONSERVATION & RECREATION)

Quantifying the Flood Reduction Potential of Urban Forests

By Daniel McLaughlin

The First Line of Defense

The urban forests of Virginia Beach—consisting of trees on both public and private property—are a cornerstone of the city’s “green” infrastructure. Chief among the many beneficial services of these ecosystems is their role in absorbing stormwater runoff—a first line of defense for flood risk reduction. Forests capture and store rainfall on their canopies, in their soils, and in shallow depressions. Importantly, forests then return large amounts of this stored water back to the atmosphere through a process termed evapotranspiration (ET), which includes plant water uptake (transpiration), soil water evaporation, and open water evaporation. (See Figure 1 on page 12.) Through this combination of water storage and loss, forests act as important water sinks in urban landscapes, decreasing stormwater volumes, timing and thus flood risk.

Conservation of Green Infrastructure

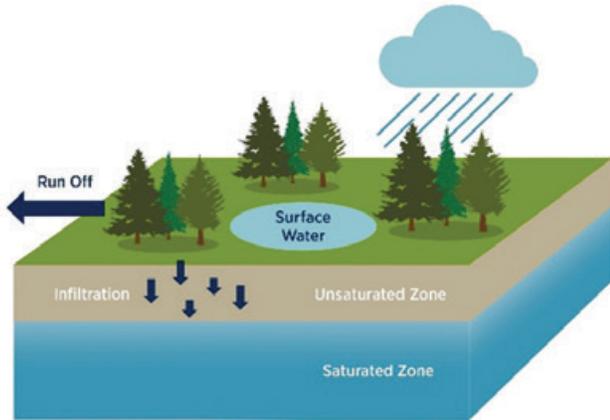
Conservation of green infrastructure is identified in the City’s “Sea Level Wise” plan as one of four pillar strategies to address recurrent flooding challenges. To ensure a holistic approach to flood risk management, the plan calls for protecting and enhancing natural systems, such as forests, in combination with strategies related to engi-

neered defenses, adapted structures and prepared communities. Virginia Beach is fortunate to have approximately 20,000 acres of forest on land owned by public agencies, The Nature Conservancy, and the city. Protection of these properties over the past 40 years has achieved significant beneficial outcomes for wildlife and outdoor recreation as well as co-benefits for flood reduction. (See Figure 2 on page 12.) Moving forward under the guidance of the Sea Level Wise plan, the city and its partners are encouraged to use flood reduction potential as the leading criteria for prioritizing protection and restoration of forests and other natural systems.

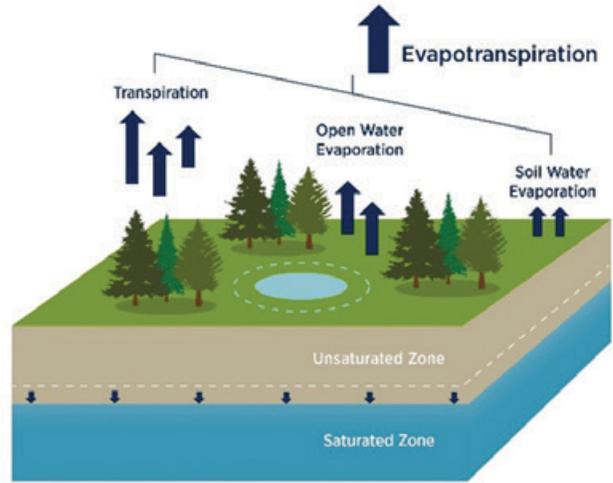
Water Storage and Water Removal Services of Forest Cover

To inform forest conservation for flood protection in Virginia Beach, a Virginia Tech research team led by Dr. Daniel McLaughlin and in collaboration with the City of Virginia Beach and The Nature Conservancy has conducted a study to quantify water storage and water removal services of across the city. These services were determined and compared across different land covers, including various forest types, low- to high-intensity urban, and agricultural areas. Water storage capacity in soils and depressions was estimated using publicly available data for soil

FIGURE 1. Runoff reduction through forest water storage and removal.

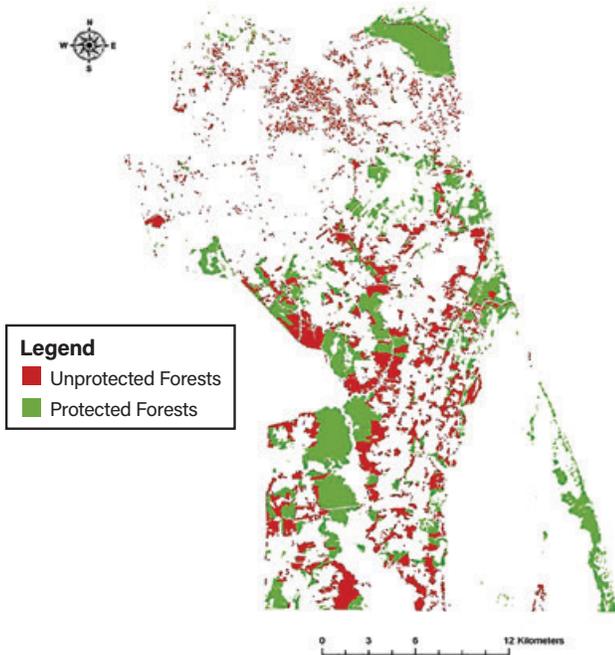


A) Water storage services during precipitation events, where depressions accumulate and store surface water (i.e., depression surface water storage) and soils infiltrate and store water in soil pores (i.e., soil water storage).



B) Evapotranspiration (ET), which includes plant water uptake (transpiration), soil water evaporation and open water evaporation, provides water removal services and reduces standing water, depletes soil moisture, and lowers the water table (i.e., top of the saturated zone).

FIGURE 2. City of Virginia Beach Protected and Unprotected Forests



characteristics, groundwater levels, and land surface elevations. Values for water removal through ET were obtained using 18 years of satellite imagery data, which were processed to estimate annual ET values across the city.

The study is the first to quantify the magnitude of water storage and removal by forest cover in Virginia Beach and underscores their potential role in stormwater management. The study found that the city's upland forests, generally situated in higher elevation areas with better drained soils, have among the highest average values for soil water storage. While their relative contribution to the city's overall water storage is limited due to a small extent (five percent of total land area), localized blocks of upland forest could be of critical flood-reduction value for specific developed areas. The study also revealed that wetland forests, the dominant forest cover in Virginia Beach, have the highest ET rates among all land cover classes (roughly three to four times that of urban areas). In fact, wetland forests contribute approximately 40 percent of all ET across land areas of Virginia Beach despite the fact they only occupy

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20 percent of total land area. For context, the volume of water removed by wetland forests is 230 million gallons/day, compared to 125 million gallons/day by larger urban areas.

In total, forest cover in Virginia Beach contributes approximately 23 percent of the city’s water storage capacity and 45 percent of its water removal potential (See Figure 3). Thus, conversion of forest cover to urban use would likely result in dramatic changes to the magnitude and frequency of flood events.

In addition to highlighting this potential consequence of forest loss, the study also points to the benefit of forest restoration. For example, open space in developed areas of

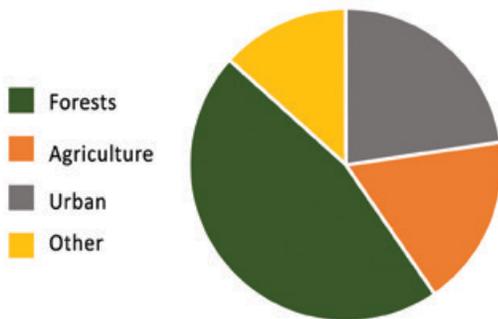
the city (approximately 16 percent of the total city area) also has high soil water storage capacity. Incorporating forest cover into these open space areas would likely increase ET (and thus removal of stored soil water), enhancing the flood reduction potential of this land cover type.

Ongoing Work

This Phase I of the overall work represents an important first step towards quantifying the flood reduction services of forest cover in Virginia Beach. New efforts are now ongoing to incorporate forests and their flood reduction features into stormwater management models, which can be used to quantify the contribution of forest cover to flood reduction under different storm event scenarios. This modeling is critical for identifying the most important forest blocks to conserve to meet flood reduction goals and to inform green infrastructure planning within broader stormwater management efforts.

Daniel McLaughlin is an associate professor in the Department of Forest Resources and Conservation in the College of Natural Resources and Environment at Virginia Tech. He has a Ph.D. in Systems Ecology and Ecological Engineering from the University of Florida, a M.S. in Environmental Engineering from Clemson University, and a B.S. in Civil Engineering from Clemson University. Daniel is a member of the American Geophysical Union, Society of Wetland Scientists, and Society for Freshwater Science.

FIGURE 3. Water removal volumes through ET.



Forests remove 45% of the City’s water via ET

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Little Stony Creek, located along the Cascades Falls Trail in Giles County. (PHOTO BY AUDREY LUX, VIRGINIA TECH)

A River Through Virginia Tech

How the Virginia Water Resources Research Center supports collaborative research and engagement on water issues

By Stephen H. Schoenholtz and David Fleming

If you want to understand a forest, you could start with the water. From seedling germination to the towering canopies of mature trees, water is the life-giving force of the forest, fueling vital processes and regulating the balance of habitats. Water influences photosynthesis, facilitates nutrient uptake from the soil, and regulates critical microclimate within forests.

If you want to understand water at Virginia Tech, you could start with the Virginia Water Resources Research Center (vwrrc.vt.edu). For 58 years (including 18 years situated in the College of Natural Resources and Environment) the center has worked to support and connect researchers

studying water-related issues, funded learning opportunities for undergraduate and graduate students, and served as a resource for citizens throughout Virginia.

“The water center operates as something of a focal point for water education, outreach, and research at Virginia Tech,” explained Stephen Schoenholtz, director of the water center and professor in the Department of Forest Resources and Environmental Conservation (FREC). “We’re an independent, non-siloed place to foster and promote research and decisions on water issues across the university.”

One of the central contributions that the water center has made is introducing a new degree program—Water: Resources, Policy, and Management—which is one of the few undergraduate degree programs in the U.S. that focuses on the complex interplay among water science, policy, and resource management. The degree is offered through FREC.

“The rapidly expanding need to address challenges of water supply, water quality, extreme weather events, and water security in the context of climate change and growing population is reflected in the strong success of our water degree graduates across diverse sectors of the job market,” Schoenholtz noted. “When prospective students ask about employment opportunities, I can confidently assure them there are many.”

In addition to the degree program, the water center coordinates grant opportunities for undergraduate and graduate researchers throughout the Commonwealth.

“Our grant program is a critical facilitation piece, and we support student research projects all across the state,” explained Professor and Associate Director Kevin McGuire, whose research focuses on the ways water moves through landscapes and forest systems. “It’s a way for us to highlight cutting-edge research, and it helps us stay connected with faculty and student researchers all across the state. We try to select proposals that align with the priorities of the region, the state, and the country.”

Past grant recipients, who are selected by a review panel of water experts, have researched the hydrological impacts of beaver activity on stream restoration, wastewater impacts on local water resources, and stormwater control measures in urban wetlands, to name just a few projects supported by the center.

A new initiative of the center with support from the Virginia Environmental Endowment and in collaboration with the U.S. Geological Survey’s (USGS) Virginia and West Virginia Water Science Center in Richmond, is the center’s Summer Water Internship Program, which aims to provide funding for two undergraduate students at Virginia Tech from underrepresented groups. Students Rasheed Pongnon and Jett Katayama are spending this summer conducting water research with USGS water scientists

and receiving career mentoring as part of their internships.

Schoenholtz adds, “This internship program is a key opportunity for underrepresented students to gain first-hand experiences to align their credentials with rapidly expanding career opportunities in water resources.”

Recently recognized as a national leader in education and outreach, the water center collaborates with the other fifty-three federally-funded water centers that comprise the National Institutes for Water Resources.

“As a group, we help coordinate regional and national water initiatives in close affiliation with the U.S. Geological Survey, which provides annual federal funding to support our mission,” Schoenholtz explained. “Right now, we are working with other mid-Atlantic water centers to coordinate newly funded research on contaminants of emerging concern in stormwater across disadvantaged communities in the Chesapeake Bay watershed.”

The water center has hosted conferences aimed at bringing regional, national, and international researchers together to talk about critical water issues, and has annually made its presence known in the halls of Washington D.C. In March, a delegation of Virginia Tech researchers affiliated with the water center was one of only 22 academic institutions invited to attend the 2023 United Nations Water Conference, which aimed to find solutions for the multidimensional challenges of pollution, drought, flooding, and severe weather.

Looking ahead, Associate Director McGuire hopes that the center will continue to be a touchpoint for researchers studying water issues.

“In order to tackle the challenges that water faces in the coming years, we need to rely on the expertise of researchers working across different disciplines,” he explained. “The more we can engage professors, future researchers, and the community into the fold, the better we can help Virginia conserve and protect our important water resources.”

For Director Schoenholtz, water is the collective tie that unites many of the critical challenges of the day.

“From extreme events such as droughts, wildfires, floods, and contaminant spills, to the emerging concerns about access to secure, reliable, and clean water for public health and environmental sustainability, water-resource challenges are a daily part of the news cycle,” he noted. “As such, the Virginia Water Center’s mission to promote water training, research, and outreach is more relevant to Virginia Tech and the commonwealth than ever before.”



Clockwise, from top: Tommy Cianciolo, former graduate research assistant with the Virginia Water Resources Research Center, collects water samples at a study site in southwestern Virginia; Dr. Daniel McLaughlin, Associate Professor of Ecohydrology in the Department of Forest Resources and Environmental Conservation and the Virginia Water Resources Research Center, takes a water sample near Blacksburg, Va.; Virginia Water Resources Research Center Research Associate Alan Raflo (third from left) assists a team of students surveying aquatic macroinvertebrates near Virginia Tech. (PHOTOS BY CASSIDY QUISTORFF, SAM DEAN, AND KRISTA TIMNEY)

Stephen H. Schoenholtz is the director of the Virginia Water Resources Research Center and professor of forest hydrology and soils in the College of Natural Resources and Environment at Virginia Tech. Dr. Schoenholtz is a member of the Soil Science Society of America, American Society of Agronomy, American Water Resources Association, Society of American Foresters, Society of Wetland Scientists, and Universities Council on Water Resources.

David Fleming is a writer and communications specialist for the College of Natural Resources and Environment at Virginia Tech.



Forests improve our water quality and increase our available water quantity.

Plant More Trees for Cleaner Water

By Caitlin Verdu and Patti Nylander

Giles County creek. (PHOTO BY CORY SWIFT-TURNER, VIRGINIA DEPT. OF FORESTRY)

Everyone needs water to live, and Virginia is fortunate to have an abundant supply. Virginia's rivers provide irrigation for crops, water supply for various types of manufacturing, and energy through hydroelectric power. Over 30,000 miles of creeks, streams, and rivers provide endless recreational opportunities including fishing, canoeing, kayaking, swimming, and wildlife viewing. In addition, the waters of the Commonwealth provide drinking water to residents either through private wells or municipal water supplies. Access to water, particularly clean water, is important for human health, environmental health, and economic growth.

While the Virginia Department of Forestry (VDOT) is no stranger to watershed forestry, the agency established a dedicated Watershed Program in the fall of 2021. This team operates with the core belief that trees are the answer to most of our environmental challenges, particularly when it comes to protecting our waterways and providing access to safe drinking water. So how do we get cleaner water? It's simple: we plant more trees.

As rain falls on a forest, the canopy intercepts the water droplets. This slows the velocity of the water as it hits the ground, which reduces erosion. The leaf litter and organic matter in the soil act like a sponge, soaking up the water and allowing it to infiltrate slowly back into the ground rather than allowing the rainwater to simply run off, carrying soil, excess nutrients, and other pollutants with it. In these ways, forests improve our water quality and increase our available water quantity.

Even in urban areas, where there may not be space for a traditional forest, trees play a critical role. Urban areas have a lot of impervious surfaces (roads, sidewalks, buildings, etc.) that do not allow rainfall to soak back into the ground. Not only can this lead to destructive flooding during storm events, but it can also reduce groundwater supplies over time. Trees help soak up that excess water, slowing the flow and reducing flood damage.

So now that we know we need to plant more trees, what resources exist to help make that happen? The good news is there are a variety of partners working on this very

issue. State and federal agencies work with communities, landowners, local governments, and nonprofits to implement strategies that will reduce the amount of pollution that makes its way into our streams. One example is VDOF's Virginia Trees for Clean Water Program (VTCW). This is a matching grant program for communities to establish more trees in urban spaces. Projects include new tree planting in urban areas that previously did not have any trees, riparian tree plantings (trees near streams), and planting trees to help reduce the impacts of stormwater.

Another example is the James River Buffer Program, which is co-managed by the James River Association, the Chesapeake Bay Foundation, and VDOF. This program funds projects that may not qualify for state or federal cost-share assistance because the landowner is not an agricultural producer. State and federal cost-share programs are also available for producers to help implement conservation practices on agricultural land such as no-till farming, planting a cover crop, rotational grazing, nutrient planning, and live-stock exclusion.

In addition to planting new trees, it is also critical to maintain the existing tree canopy. The Riparian Buffer Tax Credit Program is an excellent tool that incentivizes landowners to keep trees on the landscape.

Imagine a landowner plans to harvest a stand of trees, the edge of which abuts a creek. If they harvest all the trees right up to their waterway, they could maximize their timber profit. But in doing so, they'd be removing a mature riparian forest buffer that protects that waterway from nutrients and sediment.

The Riparian Buffer Tax Credit Program offers an alternative solution. Instead of harvesting the tract right up to the waterway, landowners can instead receive a tax credit for leaving the buffer in place. This can lead to serious savings. Landowners can receive up to 25 percent of the value of the

timber retained up to a maximum of \$17,500 in the harvest tax year. Some harvesting in the buffer is even allowed, so long as they retain at least 50 percent of the crown cover.

Virginia taxpayers are eligible to apply, including individuals, S-corporations, trusts, and others. There are a few key details to keep in mind: the tract must be at least 10 acres in size, the preserved buffer must be between 35–300 feet wide and stay in place for 15 years after the harvest, and the stand must have a VDOF-approved stewardship plan written prior to the harvest.

If you, a client, or someone you know is interested in learning more about the Riparian Buffer Tax Credit Program, please check out the VDOF webpage at <https://dof.virginia.gov/water-quality-protection/water-quality-protection-landowner-assistance/riparian-forest-buffer-tax-credit/>.

Virginia is diverse and so are our land uses, from the rugged backcountry of Mt. Rogers to the hustle and bustle of downtown Richmond. No matter where you may live, there is something you can do to help improve water quality at a local and watershed scale. If you live in a rural area near a creek, consider planting trees next to the creek to establish a buffer, or pursuing a tax credit to keep a buffer in place. If you live in a more urban part of the state, participate in a community tree planting, or consider adding new trees to your yard. If you would like more information on ways you can help protect and improve water quality, reach out to your local VDOF forester and visit our website at: www.dof.virginia.gov. 🍷

Caitlin Verdu is the Virginia Dept. of Forestry's Watershed Program Manager. She can be reached by email at caitlin.verdu@dof.virginia.gov.

Patti Nylander is the Central Watershed Specialist with Virginia Dept. of Forestry. She can be reached by email at patricia.nylander@dof.virginia.gov.



Mariner's Museum and Park. (PHOTO COURTESY OF VIRGINIA DEPT. OF FORESTRY)



A riparian buffer along Stroubles Creek in Blacksburg, Va. (PHOTO BY CORY SWIFT-TURNER, VIRGINIA DEPT. OF FORESTRY)



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As consulting foresters, one of the first things we evaluate when considering forest management operations is the impact on water resources. What streams are present? How big are their watersheds? Where are stream buffers needed, and how wide should they be? How will we cross streams? Once operations begin, we evaluate how well our buffers and

crossings work. Are those steel bridges on skidder crossings protecting stream banks and beds? Is the haul road contributing any sediment? Do the buffers work? And our work isn't complete after operations conclude. We revisit sites to make sure that a storm didn't blow out a culvert and that road and skidder crossings are properly stabilized. We carefully plan reforestation operations to make sure herbicide applications don't impact water quality.

We like to say, "A healthy forest is no accident." We should also say, "Clean water is no accident!"

We work tirelessly to make sure our forests not only produce the wood and fiber our society needs, but also provide that most fundamental need of all, that of clean water. 🌿

—The Executive Committee of the Virginia Chapter ACF



A small waterfall over a pond at Dark Hollow Falls trail in Shenandoah, Va. (PHOTO BY JACOB HAKIZIMANA)

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Significant Investments for a Successful Water Quality Program

By Scott Barrett, Ph.D.

Extension Specialist—Forest Operations

Virginia Tech Department of Forest Resources and Environmental Conservation

Protecting water quality is important for all Virginians. Virginia has an excellent Silvicultural Water Quality Program which is a result of a combined effort from many groups. The Virginia Department of Forestry (VDOF) makes significant investments in staff and other resources to ensure the Commonwealth's forests are providing clean water while also allowing for harvests that support Virginia's forest industry. Loggers, landowners, forest industry, and others also make significant investments to make this program work.

VDOF inspects all forest harvesting operations in the Commonwealth to ensure protection of water quality. On average, this is around 4,000 harvest sites per year. Implementation of best management practices (BMPs) for water quality is high and statewide audits conducted by VDOF verify this. The latest audits showed an overall statewide implementation rate of 93 percent of all applicable BMPs. In the Chesapeake Bay watershed area, implementation rates were even higher at 95.9 percent. This high implementation rate is remarkable and shows the tremendous effort put into protecting water quality by loggers and all those who have a role in this program.

Protecting water quality comes with a price tag. Costs are paid by loggers, landowners, enforcement agencies, forest industry, and others. Loggers incur direct costs for



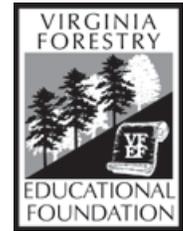
implementing BMPs through things like their machine and personnel time as well as purchasing materials such as seed and mulch for stabilizing bare soil areas. Our last SHARP Logger survey included a section related to BMP implementation costs. Based on this survey we estimated that the average direct BMP implementation costs incurred by loggers were approximately \$32 per acre. In 2022 there were over 180,000 acres harvested statewide so this represents close to \$6 million invested each year by Virginia logging businesses to keep Virginia's waters clean.

The direct investment in BMP implementation by logging businesses is only part of the total investment. One of the most common and most effective BMPs for protecting water quality are Streamside Management Zones (SMZs) where timber is not harvested, or only partially harvested. This represents an opportunity cost for landowners who leave this timber

unharvested for the purposes of protecting water quality. Our survey data indicated that the cost to landowners for leaving this timber unharvested could be five times greater than the logger's direct cost of implementing BMPs. Generally, up to 50 percent of the timber can be harvested from SMZs and partial tax credits are available for timber that was left in SMZs, but this still represents a significant opportunity cost incurred by forest landowners.

The combined efforts and financial investments by all groups involved are the key reasons why Virginia's BMP program has been so successful. Collectively, VDOF, logging businesses, forest industry, forest landowners, as well as our Extension and research programs collaborate to protect water quality on forest harvesting operations. This not only protects water quality today, but also our ability to continue harvesting in the future.

Investments in water quality are working. BMPs for protecting water quality are implemented at a high rate, and water quality is protected while landowners, loggers, and forest industry are able to harvest timber and produce forest products. This is a success story, and everyone who is involved in Virginia's water quality program should be proud of their contribution to the sustainability of forest resources in Virginia. 🍷



Virginia Forestry Educational Foundation Update

Remembering & Recognizing the Loss of a Forestry Great—Dr. Harold Burkhart

By R. Easton Loving, VFEF Board of Directors

On October 20, 2022, we lost one of the true forestry greats of our time—Dr. Harold Burkhart. This was an immense loss to forestry communities in Virginia, across the U.S., and around the world. The magnitude of this loss is difficult to put into words, particularly when framed against the many contributions Harold made to the practice of forestry, natural resources education, and Virginia Tech. What a true blessing for all of us that were touched by his greatness and the legacy he leaves for generations to come.



Harold joined the Virginia Tech faculty in 1969 and served the University until his passing. The University recognized him with the preeminent rank of University Distinguished Professor in 1999 for his many contributions, particularly in the field of forest modeling and biometrics. In 2013 he was selected as Virginia’s Outstanding Scientist, and among forest scientists he was considered “the father of forest biometrics, which explains the theory and applications of quantitative models of forest stands,” noted Virginia Tech President Emeritus Charles W. Steger.

Harold served as a committee member for more than 150 graduate students in programs across Virginia Tech, including 60 master’s degree students and doctoral candidates who completed degrees under his direction. He published over 300 research papers, research bulletins, book chapters, and proceedings papers. In addition, he authored two widely used textbooks, including the undergraduate textbook *Forest Measurements*, now in its sixth edition. As a young sophomore forestry student, I immersed myself in his *Forest Measurements* textbook, and it has a very prominent place on my bookshelf.

In my career I had the good fortune to know Harold as a colleague. I have always enjoyed returning “home” to Virginia Tech, whether it is the opportunity to speak to a class, participate in a career fair, serve on a Board, but especially when I can visit with former professors. Professor Emeritus David Wm. Smith summed up Harold as follows: “Dr. Burkhart was truly a man for all seasons. Harold was an icon and legend in the profession of forestry. He was a world-renowned researcher and educator and impacted the management of forests and lives of professional foresters

for more than five decades. Above all, Harold was a very kind, humble, and gentle person.”

Harold embodied the spirit and motto of Virginia Tech, *Ut Prosim*, translated “That I May Serve”, and he embodied it in his professional life and encouraged his students and colleagues to do the same.

Over the past few years, I had the fortune of serving with Harold on the Virginia Forestry Educational Foundation (VFEF) Board of Directors. His thoughtfulness, care, and humble nature were always on display. He was a man that looked forward and understood the importance of VFEF’s mission in supporting youth education. As I sat with and listened to him in our meetings Harold’s gift to connect with and teach others was always on display. He will be deeply missed by the VFEF Board, but his lasting contributions and legacy live on.

Now we have the honor and responsibility to recognize and remember the greatness of Dr. Harold Burkhart. VFEF has established an endowed scholarship in Harold’s memory, and the proceeds will go to support forestry education at Virginia Tech. I encourage each of you to support

this endeavor and earmark your upcoming VFEF contribution for the Harold Burkhart Scholarship. This is a great opportunity for former friends, students, and colleagues of Harold to provide a gift that appropriately recognizes his greatness and will carry his legacy forward. In addition, Virginia Tech's College of Natural Resources and Environment (VT-CNRE) has launched a fundraising initiative to create an endowed fellowship in honor of Harold. If you have interest in this initiative please contact Andrew Ickes, Assistant Dean of Advancement at VT-CNRE by email at aickes@vt.edu.

I plan to support both Burkhart initiatives—the VFEF Endowed Scholarship and the VT-CNRE Fellowship. It is on the shoulders of greatness that many of us owe a debt of gratitude. Thank you, Harold, for your guidance and friendship. 🍷

John E. Jones III
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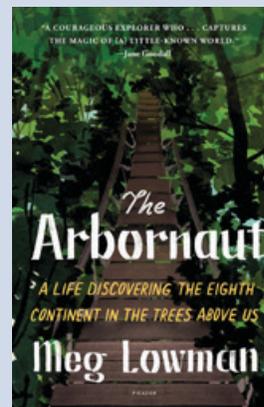
The Arbornaut

A Life Discovering the Eighth Continent in the Trees Above Us

Written by Meg Lowman

Reviewed by Anne Beals, Magazine Editorial Committee

These are the struggles of a female scientist in a very male world. For most of her life, when challenged, bullied, ignored, or worse, physically violated, Lowman would just retreat further into her science world, to the



benefit of the science and, she believed, to her career and life. However, once she got to the point where she felt strong enough, she decided to make herself heard—not in a strident, blameful way, but in a way that would bring others into her realm and advance her science. A very admirable stance.

Deeply interested in the natural world from a very early age, the author developed the concept of the Eighth Continent, that of the earth's tree canopy, and dubbed herself an Arbornaut. She invented a safe way to hoist herself solo up into canopies of various heights and locations where she found worlds of unexplored wonder. Lowman eventually received grants to study and teach all over the planet and became a peerless educator. It's our joy to experience her joy in discovery and to find that, in the process, she has grown a global brigade of Arbornauts.

Even though it contains her life's timeline, *The Arbornaut* can be opened and enjoyed at any point in the story while also being useful as a reference, since each chapter is accompanied by a particular tree and its dendrology, bringing logic to the story of her studies. 🍷



Seal “basking” on a dock in Mathews County during a nor’easter.

Hello from the Bay

By Lisa Deaton



When I was a student at Virginia Tech in the late '80s, I remember Dr. David Wm. Smith telling us that if it was possible to average out the damage, the Commonwealth of Virginia had lost the equivalent of one foot in elevation to soil erosion. Much of that erosion ended up in the Chesapeake Bay.

During my first job with Union Camp Corporation, Virginia’s Forestry Best Management Practices for Water Quality were instituted, and I recall my father-in-law debating the merits of Streamside Management Zones because, “That’s where the best timber grows!” Then, I became an Area Forester with Virginia’s Department of Forestry on the Middle Peninsula in 2015. I arrived at a log deck that had gone underwater during a fall tidal surge and saw crab claws scattered around. I thought to myself, “Well Toto, we’re not in Kansas anymore.”

Those of us who live and work close to the Chesapeake Bay may get to see more results of the epic level of conservation activities that have taken place in the Bay Watershed since the 1970s. In Charlottesville, you can eat oysters, but you don’t get to watch them grow back on the shorelines. The creek where I live was condemned for shellfish harvest 30 years ago, but not today. In fact, over the past year, the acreage of waters with shellfish restrictions in Mathews County dropped from 8,322 to 6,764 acres. Underwater grasses are appearing in the mouth of our creek for the first



Wildflowers in the SMZ (left to right): Duck potato (*Sagittaria latifolia*) and white turtlehead (*Chelone glabra*).



Spotted turtle enjoying a pool in a thinned pine plantation.

time in recent memory. In Gloucester County, our summer intern and I watched spotted turtles dive for cover in pools on a log road. The strangest wildlife sighting at our house was a seal that had spent part of the winter of 2018 basking on our floating dock. At first, I thought it was an otter missing its front legs. It turns out that the harbor seal population is on the rebound, and they migrate as far south as the Outer Banks of North Carolina. Last fall, I found myself in a “roost” of monarch butterflies migrating through a shoreline

grove of live oaks, marsh-elder, and groundsel near New Point Comfort Lighthouse.

The American Tree Farm System holds its members to a rigorous set of “Standards of Sustainability.” Standard 2 requires that forest management activities comply with all relevant federal, state and local laws, regulations and ordinances, such as Virginia’s Silvicultural Water Quality Law. Standard 4 requires that forest management practices maintain or enhance the ecosystems and ecosystem services provided by the forest, including air, water, soil and site quality. Tree Farmers must comply with all state forestry best management practices, even if they are voluntary. Leaving

forested buffers during harvest operations on all 700 Tree Farms in Virginia not only protects water quality but also creates a substantial network of wildlife corridors.

The overall scope of work undertaken to improve the Chesapeake Bay is truly mind-boggling. If you are not familiar with the issues, glance over the Chesapeake Bay Program website (chesapeakebay.net) or visit bayjournal.com. Sound forest management by Virginia Tree Farmers is just one piece of the puzzle. But from the point where land meets water, it feels a little bit like the puzzle is slowly being put back together. 🍷



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Choosing a Forester

by Matt Dowdy, Magazine Editorial Committee

About 25 years ago as a young forestry consultant, I had scheduled my first meeting with a prospective new client. Up until this time, I was mainly working as a field forester for a consulting company. My daily tasks included marking timber, flagging boundary lines, and timber cruising. Finally, I decided I was ready to take the next step and find my own clients.

I was nervous, as you can imagine. My meeting was with a former Extension agent who owned 80 acres of timberland on a mountain in Madison County. We scheduled our meeting and met onsite for our walk-through. It was a nice stand of poplar, but still a bit young. I remember advising the landowner that the timber really should grow another 10 years or so. He was almost 80 years old and grinned, "I will look forward to that, but I'm not holding my breath."

We continued our walk though the property. We both spoke, and we both listened to each other. He was 50 years my senior and gave me little indication of whether he liked what I had said or not. Finally, we got back to his truck, a small Datsun pickup truck. He looked in the back and there was a huge pile of dog feces in the back. He looked down at his dog and said, "Now I know that you did not do that!" He then glared at me, expressionless. I proclaimed, "Don't look at me, I was with you the whole time!" He looked sternly at me for a moment and, finally, smiled. At that moment I knew I had my first client.

When choosing a forester there are several things to look for to ensure that you have a successful working relationship.

- 1. Communication.** In my typical client relationship, I may work with a landowner for up to five years for just one timber sale. You must establish a solid relationship. Timber is often sold on a two-year harvesting contract, and then the reforestation process may take up to two years after the timber harvest for loblolly pines to be free to grow. During this time, both sides must have ongoing and open communication. Ask your forester plenty of questions, and don't be afraid to reach out. Bear in mind that your forester works on multiple projects. Let your forester know about your preferred methods of communication up front, from in-person meetings, phone calls, e-mails, and text messages. In-person meetings are what I prefer, but I have also sold timber for absentee landowners whom I have never met.



- 2. Share Common Goals and Vision.** Your forester should ask you about your goals and objectives and make recommendations accordingly. If your primary goal is wildlife habitat for whitetail deer hunting, your forester should not advise you to create 200-acre clearcuts; they should be promoting diversity for habitat.
- 3. Trust.** You can't establish a good working relationship without trust in your forester. This trust also works both ways. In my career, I've learned that I can't properly represent a client if I don't trust them. If you don't have trust in the recommendations from your forester, it will become a major difficulty in your business dealings.
- 4. Credentials & Experience.** Don't be afraid to ask for credentials and experience. Most of the time, references are good, as nobody is likely to voluntarily put you in touch with a bad reference. I think credentials are important and often show a commitment to higher quality service, as these individuals have gone the extra step to be professional. For example, there are barriers to entry to become a member of the Association of Consulting Foresters or a Society of American Foresters Certified Forester.
- 5. Know the Agency or Business Represented by Your Forester.** Always ask who your forester is representing

and if they both sell and buy timber. Procurement foresters are often paid by a mill. Virginia Dept. of Forestry foresters are paid by the government, and your forestry consultant is paid by you. None are better or worse to use, just know who they are working for.

6. Understand the Scope of Services and Included Costs. Be sure that you match your needs to the services provided by your forester so that you don't incur unexpected additional expenses, like surveying, reforestation, management planning, or timber

taxation. One of my favorite lines is that if you ask three foresters their opinion you could get five different answers. I often begin my answers with, "It depends." The same forest stand may have several different recommendations based on the landowner's objectives or the opinions of their forester or both.

Forest management is often not black or white, it is shades of green. Choose a forester who sees the same shade of green as you. 🌲



Photo by Joshua Housman, second place winner, Virginia Fauna (2022)

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PRESIDENT'S COLUMN, continued from page 7.

money in who went on to do something else. I hope this does not happen, but chances are it will. The downside is that they are no longer working at your business; however, you may have the great fortune to work with them in the future in their new position.

The relevance of all this is that we are all mentors at some point in our careers, as well as in life. It is important for us to recognize this opportunity to help our young professionals as they enter the workforce. Additionally, we need to mentor the young folks coming along. We all have friends or family members with children who have an interest in what we are doing. This is a good opportunity to take them out to help with marking a property line, walk a stand of timber, or look at a timber harvest. The Holiday Lake 4-H Forestry Camp and Scouts often provide great opportunities to help those young people who have an interest in what we do.

There are those who may not know the range of opportunities that exist in the field of forestry and the forest products industries. Thankfully, we have Virginia Tech and Mountain Gateway Community College that bring new, skilled professionals to our industry. However, there are also those students who want to pursue careers in heavy equipment operation, mechanics, welding, or truck driving but have no idea that good jobs in these areas are also available

in our industry. VFA is continuing to examine opportunities for workforce development that will help create ways to reach these future workers through schools and training programs that exist throughout the Commonwealth. The workforce is out there, we just need to reach them.

Today's workforce is a challenge for many of us. Finding qualified workers and professionals who care about your business and industry as much as you do is a big part of this challenge. As leaders in this industry, we need to find successful strategies to attract the quality employees that are out there and provide the tools for them to succeed in our industry. Recognize the people that care about our industry as much as we do, and mentor them along.

But please don't tap the brake and strike the horn to wake them up. It is really not that funny. My heart rhythm is still off. Thanks, Mr. Brooks. ☹

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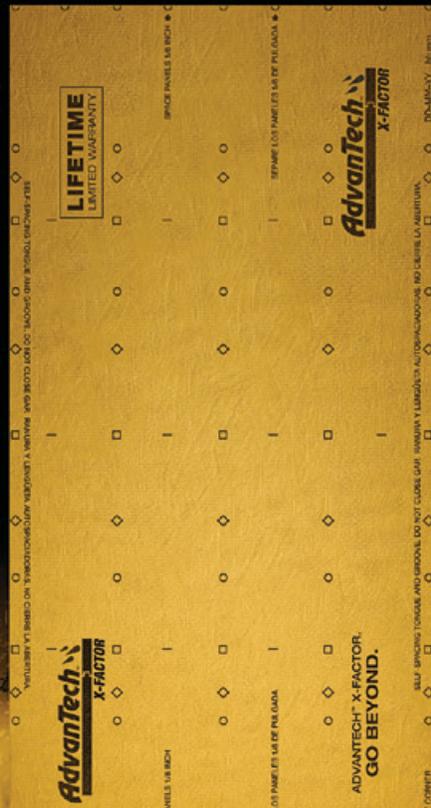
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