RIVERE
Research • Education • Technology • EcoCulture

4730 Wallace Lane
Fredericksburg, VA 23408
www.RIVERECenter.org
Updated 4-24-23

Executive Summary

The need to enhance and increase access to emerging technologies is one of the top national water challenge priorities for the next 25 years. Scientific research using automated sensors, machine learning, and big data integration will play a critical role in water research and intelligent water management decisions. The Rappahannock, the longest free-flowing river in Virginia and the Chesapeake Bay watershed, is an ideal watershed for supporting this national water priority. The Rappahannock River is big enough to provide meaningful challenges to test watershed Best Management Practices (BMPs), but is small enough to demonstrate successful BMPs. In addition, unprecedented environmental pressures projected for the Rappahannock provide an opportunity to proactively detect and mitigate changes over time through deployment of a watershed-level wireless sensor network to pilot emerging technologies. The region containing Stafford, Spotsylvania, King George and Caroline counties, and the City of Fredericksburg is projected to increase up to 60% in the next 20 years, making it the fastest growing area within Virginia. Projected intensification of urban and suburban development in the watershed will accelerate nutrient and sediment loading and ecological habitat decline. There is an urgent need to proactively address this challenge.

RIVERE℠ is a 501(c)(3) nonprofit corporation that will take a lead role in supporting this effort by building a world-class ecological center designed in form and function to attract, support, and integrate technology-enhanced scientific research into conservation, education, and outreach in the Rappahannock River watershed.

- **Location**: The RIVERE℠ Center will be located on 4-acres at the historic Embrey Power Plant site, as part of the revitalization of Fredericksburg's Maker's District. The Center will be within walking distance to vibrant downtown Fredericksburg, a high tourism area, local hotels, a walking/biking trail, and a train station that connects to Richmond and Washington D.C.

- **An Entrepreneurial Approach**: RIVERE℠ will serve as a host and a facilitator that provides a centralized location and support resources for water researchers, government agencies, nonprofits, environmental educators, and technology entrepreneurs. RIVERE℠ will support and enhance their work by offering:
    - **Indoor & Outdoor Space**: A high tech facility with laboratories, conference and education space, direct river access, and urban native landscaping to demonstrate watershed BMPs.
    - **Coworking Membership Model**: A modern alternative to office rentals that provides flexibility and cost savings, as conceptualized and proven successful by Gather Workspaces, LLC (Gather®). RIVERE℠ is seeking the talents of Gather® to manage the physical facilities of the Center in alignment with their existing facilities in Richmond and Hampton Roads.
    - **Exhibits**: A destination to showcase scientific research and Native American traditional ecological knowledge through exhibits that attract regional ecotourism and connect the public with science and ecoculture.
    - Commitment to **economic, environmental, and social sustainability**, with Living Building design guidance from prestigious SmithGroup architects and Commonwealth Architecture.

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- **Supporting Research and Technology**: RIVERE℠ will coordinate the Rappahannock SmartRiver initiative to serve as a focal point for collaboration involving emerging technologies designed to enhance water quality monitoring and research.
    - **Goal**: Support the development of technologies and BMPs that scale up to larger river systems. Combine artificial intelligence and wireless sensors to generate real time "big data" to inform rapid response and predictive modeling of water quality and quantity.
    - **Advisory Board**: Experts from Virginia Cooperative Extension, Virginia Tech, Virginia Innovation Partnership Corporation, Friends of the Rappahannock, Chesapeake Bay Foundation, USGS Next Generation Water Observing System, Rappahannock River Basin Commission, and University of Mary Washington.
    - **Key Collaborators**: Through a partnership with Virginia Innovation Partnership Corporation (VIPC), RIVERE℠ will facilitate research on the Rappahannock in the areas of wireless water quality sensor acquisition and deployment, data integration, and cloud-based computing by engaging the Virginia Smart Community Testbed (a partnership between VIPC and Stafford County EDA). RIVERE℠ will enhance the Testbed's water vertical while benefiting from three ecosystems that confluence at the Testbed: 1) Verizon Innovation Hub ecosystem, 2) RIoT ecosystem, and 3) VIPC Living Laboratories ecosystem to identify technology and entrepreneurs.

- **Supporting Education, Outreach & Ecoculture:** RIVERE℠ will offer indoor and outdoor space to support and enhance environmental education, outreach and ecoculture initiatives.
    - **Goal**: Provide adaptable, technology-enhanced classroom, meeting, and exhibit space to host educational events and conferences. Leverage the power of virtual/augmented reality technology to enhance accessibility and reach of environmental education through virtual field trips and immersive learning experiences related to Rappahannock River ecology and regional Native American Tribes.
    - **Key Collaborators**: Educational initiatives at the RIVERE℠ Center will be led by Friends of the Rappahannock, a non-profit organization that provides nationally recognized environmental education programs to over 15,000 students annually. Outreach and ecoculture initiatives will be conducted in partnership with Virginia Cooperative Extension and the Patawomeck Native American Tribe.

- **Impact**: Combined, the Rappahannock SmartRiver and technology-enhanced educational initiatives at RIVERE℠ form an exciting opportunity to leverage ecotourism to connect the public with cutting-edge science, promote research and education, and demonstrate urban BMP landscaping to protect water quality in the Rappahannock watershed and beyond. Ecotourism from RIVERE℠ can result in significant financial benefits for the City of Fredericksburg and the region.