



PREPARED FOR
RIVERESM



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Economic Impact of the RIVERESM Center in GO Virginia Region 6

1. Background & Summary

RIVERESM is leading the effort to establish a world-class ecological research and education center in Fredericksburg, Virginia. Located on the historic Embrey Power Station site within the city's Creative Maker District, the Center will serve as a hub for water research, conservation, education, and ecopreneurship. The four-acre site is within walking distance of downtown Fredericksburg, local hotels, regional trails, and a train station connecting Richmond and Washington, D.C., ensuring accessibility to local, regional, and national partners and visitors.

Planned components of the RIVERESM Center ("the Center") include:

- A high-tech ecological research facility with laboratories, conference and education space, and direct river access.
- The Rappahannock SmartRiver Initiative – a watershed-scale deployment of wireless water quality sensors integrated with artificial intelligence to generate real-time data for predictive modeling of water quality and quantity.
- Immersive, technology-enhanced educational exhibits, including projection wall mapping, Virtual Reality/Augmented Reality learning environments, and outdoor classrooms that support K-12 and community programming.
- A coworking membership model for researchers, government agencies, nonprofits, educators, and environmental entrepreneurs that foster collaboration and innovation.
- Design elements of the indoor and outdoor spaces include sustainable landscaping and adaptable configurations for public events, workshops, and conferences.
- A virtual center connecting data, experiences, and experts globally through web, mobile, and VR platforms.

Chmura Economics & Analytics (Chmura)¹ analyzed the potential economic impact over the next ten to twenty years of the proposed RIVERESM Center in GO Virginia Region 6.²

With the focus on the time period from 2035 to 2045, the analysis excludes construction and initial operations, and the economic impact of the project comes from three sources:

- **Ongoing Center operations:** The ongoing operations of the Center, including research, administrative, and maintenance staff.
- **Ongoing coworking operations:** As businesses located within the Center hire workers for their ongoing operations, the regional economy and those businesses will benefit from these operations. These are expected to be a mix of research and development startups and nonprofits.

¹ Chmura provides economic software, consulting, and data to our clients that help them make informed decisions to benefit their communities. Chmura's PhD economists, data scientists, and strategic planners guide clients through their local labor market. Over the past 26 years, Chmura has served hundreds of clients nationwide with thoroughness, accuracy, and objectivity.

² GO Virginia Region 6 is defined as the City of Fredericksburg and the counties of Caroline, Essex, Gloucester, King and Queen, King George, King William, Lancaster, Mathews, Middlesex, Northumberland, Richmond, Spotsylvania, Stafford, and Westmoreland

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- **Visitor spending outside of the center:** Many people who visit and attend events at the center will come from outside the region. They will stay in regional hotels and patronize other regional businesses, such as restaurants and retail establishments. The associated visitor spending will also benefit local economies.

The three components identified above (Center operations, coworking operations, and visitor spending) constitute the direct economic impact of the proposed RIVERESM Center. The total economic impact also includes the economic ripple effects from the direct impact. Using visitor spending as an example, indirect effects include benefits to industries that supply regional hotels or restaurants patronized by visitors. Induced effects occur when workers hired by visitor-serving businesses spend their income in the region.

Additionally, there are several sources of qualitative impact. The RIVERESM Center will leverage advanced technologies to support research and collaboration, while engaging the public through immersive educational experiences. The project will convene a wide range of collaborators, including Virginia Tech, Virginia Cooperative Extension, Friends of the Rappahannock, the Chesapeake Bay Foundation, U.S. Geological Survey (USGS), the Rappahannock River Basin Commission, and the Patawomeck Indian Tribe of Virginia. In renovating a derelict building to a state of the art center, the Center is also expected to improve property values in the surrounding community.

Chmura estimated the direct impact of the Center based on data provided by RIVERESM in their latest business plan. Chmura estimated indirect and induced impacts using Chmura's JobsEQ® economic impact model.

The following summary highlights the project's impact.

- Chmura estimated the impact of the Center operations between 2035 and 2045, when construction is completed and all businesses are operating. The operations of the Center, including research, administration, and maintenance, will generate an estimated annual economic impact (direct, indirect, and induced) of \$2.8 million on average each year in Region 6, supporting an average of 23 jobs each year over this period.
- The operations of various businesses in the Center will generate an annual economic impact (direct, indirect, and induced) of \$33.2 million in Region 6, supporting 174 jobs on average.
- Chmura estimated that spending outside the Center by visitors will generate an annual economic impact (direct, indirect, and induced) of \$1.8 million in Region 6, supporting 11 jobs on average each year.
- Combining the three impact sources above, the Center can generate a total annual impact of \$37.8 million, supporting 208 jobs on average each year.
- The Center can also generate considerable but less measurable impact through community outreach, supporting K-12 education, and promoting ongoing ecological research and development.

Total Economic Impact of the RIVERE Center Averages \$37.8 Million Per Year in GO Virginia Region 6

		Direct	Indirect	Induced	Total Impact
Cumulative (2035-45)	Spending (Million)	\$334.8	\$26.8	\$54.7	\$416.3
	Employment	1,617	164	506	2,287
Annual Average (2035-45)	Spending (Million)	\$30.4	\$2.4	\$5.0	\$37.8
	Employment	147	15	46	208

Note: Numbers may not sum due to rounding.

Source: RIVERESM and JobsEQ by Chmura

2. Economic Impact of the RIVERESM Center

2.1. Economic Impact of Operations

After construction is complete in the near future and the RIVERESM Center reaches full operational capacity, the facility will generate sustained economic and community benefits in GO Virginia Region 6. Operational impacts of the Center will stem from the direct employment of Center staff and the indirect and induced effects of this activity in the local economy.

The analysis below is based on the assumption that the Center will achieve steady-state operations between 2035 and 2045, after initial ramp-up phases. Impacts are therefore not calculated for construction or early years, but rather for the period when the Center is fully staffed and occupied.

The analysis incorporates several key assumptions from the RIVERESM business plan. Chmura uses the midpoint of operational scenarios presented in the business plan. Specifically, Chmura assumes a 20,000 square foot, medium-sized building footprint with full occupancy at 220 seats (individual or shared workspaces within the coworking space and office).

At full operation, the RIVERESM Center will directly employ 17 staff members responsible for research coordination, education programming, facilities management, outreach, and administration. Indirect impacts will flow to local businesses that supply goods and services to the Center, including maintenance providers, utilities, IT services, and educational suppliers. Induced impacts will occur when staff and member spending supports restaurants, retail, housing, and healthcare services in GO Virginia Region 6.

Chmura used the data from RIVERESM and Chmura's own research to estimate the operational revenues of the Center. The estimated annual operational revenue of the project will average \$1.7 million between 2035 and 2045.

Table 2.1 presents the estimated economic impact of Center operations GO Virginia Region 6. Chmura estimated that between 2035 and 2045, when the Center is built and fully staffed, operations can generate an annual economic impact (direct, indirect, and induced) of \$2.8 million in the region, which can support 23 jobs. Of the total impact, \$1.7 million comprises the estimated direct impact – equivalent to the annual operational revenues of the Center and incorporating inflation expectations. Direct employment is estimated at 17 full-time equivalent jobs.

Table 2.1: Economic Impact of Center Operations Averages \$2.8 Million Per Year in GO Virginia Region 6

		Direct	Indirect	Induced	Total Impact
Cumulative (2035-45)	Spending (Million)	\$19.2	\$5.2	\$6.3	\$30.8
	Employment	187	22	46	254
Annual Average (2035-45)	Spending (Million)	\$1.7	\$0.5	\$0.6	\$2.8
	Employment	17	2	4	23

Note: Numbers may not sum due to rounding.

Source: RIVERESM and JobsEQ by Chmura

Chmura estimated the indirect impact at \$0.5 million on average in the next ten to twenty years, supporting two jobs in the region. Chmura also estimated the induced impact in the region at \$0.6 million on average, supporting four jobs.

2.2. Economic Impact of Coworking Space

In addition to direct staffing, the RIVERESM Center will generate significant economic and community benefits through its coworking membership model. This model provides flexible space and resources for ecopreneurs, researchers, and

nonprofit organizations working in water and environmental innovation. Members benefit from shared access to laboratories, collaborative workspaces, immersive exhibit areas, and educational programming.

Chmura modeled the potential impact of this coworking framework by applying assumptions from the RIVERESM business plan. The results indicate that the Center's coworking program will serve as a pipeline for research and development products and services and nonprofit growth. Specifically, the coworking space can support 121 jobs (about 60% of available coworking seats) across 12-15 active organizations at any given time. Activity is assumed to be split evenly between scientific research & development entities and nonprofit organizations.

These enterprises will contribute to the local economy through their demand for professional services, lab equipment, and community resources. Indirect impacts will accrue as organizations expand into larger facilities within the region, stimulating further economic development and anchoring GO Virginia Region 6 as a hub for ecological innovation.

Based on Chmura's research, the estimated annual operational revenue of the organizations in the coworking space could average \$27.2 million between 2035 and 2045.

Table 2.2 presents the estimated economic impact of coworking operations.

Chmura estimated that on average from 2035 to 2045, the RIVERESM Center can generate an annual economic impact (direct, indirect, and induced) of \$33.2 million in GO Virginia Region 6, which can support 174 jobs. Of the total impact, \$27.2 million makes up the estimated direct impact, which is equivalent to the annual operational revenues of all businesses in the coworking space of the Center. Estimated direct employment is 121 full-time equivalent jobs.

Chmura estimated the indirect impact at \$1.8 million on average, supporting twelve jobs in the region. Beneficiaries include businesses in a wide range of industries that support business operations such as legal services, marketing, banking, and food suppliers. Chmura also estimated the annual induced impact in the region at \$4.2 million on average, supporting 40 jobs. Beneficiaries of the induced impact mostly consist of consumer service businesses such as retail shops, restaurants, and healthcare facilities.

2.3. Economic Impact of Visitor Spending

The completed RIVERESM Center is expected to become a regional destination for environmental education, research exchange, and ecological tourism. Drawing on peer benchmarks such as the Brock Environmental Center, the Center is projected to attract approximately 25,350 visitors annually, averaging nearly 70 visitors per day. This level of visitation represents a conservative 3% of the annual visitors to the nearby Fredericksburg & Spotsylvania National Military Park, highlighting existing visitor demand for ecological and historical experiences in the region.

Table 2.2: Annual Impact of Coworking Operations Averages \$33.2 Million in 2035-2045 in Region 6

		Direct	Indirect	Induced	Total Impact
Cumulative (2035-45)	Spending (Million)	\$299.0	\$19.8	\$46.6	\$365.4
	Employment	1,331	135	445	1,911
Annual Average (2035-45)	Spending (Million)	\$27.2	\$1.8	\$4.2	\$33.2
	Employment	121	12	40	174

Note: Numbers may not sum due to rounding.

Source: RIVERESM and JobsEQ by Chmura

Some visitors will patronize other regional businesses offering food and lodging, benefiting tourism industries. To estimate visitor spending, Chmura first calculated the average per-person spending for leisure visitors in the region, based on data from the Virginia Tourism Corporation (VTC).³ Chmura assumed that all out-of-Center spending will occur within GO Virginia Region 6.

Chmura assumed that local visitors would comprise 93% of all visitors, who will make day trips to the events at the Center.⁴ The remaining percentage of visitors includes overnight visitors who will stay in hotels in the region. Chmura estimated that visitor spending can reach an average of \$1.5 million each year in the next ten to twenty years. Visitor spending is allocated to different sectors such as gasoline, food and drink, lodging, and shopping.

Table 2.3: Annual Impact of Visitor Spending in Region 6 Average \$1.8 Million in 2035 to 2045

		Direct	Indirect	Induced	Total Impact
Cumulative (2035-45)	Spending (Million)	\$16.6	\$1.8	\$1.8	\$20.2
	Employment	99	7	16	123
Annual Average (2035-45)	Spending (Million)	\$1.5	\$0.2	\$0.2	\$1.8
	Employment	9	1	1	11

Note: Numbers may not sum due to rounding.

Source: RIVERESM and JobsEQ by Chmura

Direct visitor spending can generate additional economic impact in the region (Table 2.3). Chmura estimated that the total annual economic impact (direct, indirect, and induced) of visitor spending will reach \$1.8 million on average in this period, which can support 11 jobs in the region. Out of this impact, direct visitor spending can reach \$1.5 million on average, which can support 9 jobs in the region, mostly in tourism-related businesses such as hotels, gas stations, restaurants, and retail shops. Additional indirect and induced benefits exist in the region as well. In total, visitor spending can have an average annual impact of \$1.8 million in economic output and support 11 jobs.

³ Source: Virginia Tourism Corporation. "Travel Data and Profiles." Virginia Tourism Corporation. Accessed September 2025. <https://www.vatc.org/research/travel-data-and-profiles>

⁴ This is consistent with visitors to local attractions based on previous studies and surveys Chmura has conducted. See, for example, <https://articles.vafb.com/the-meadow-event-park-study-finds-significant-economic-impact/>

E3. Qualitative Impacts

In addition to its measurable economic contributions, the RIVERESM Center will generate substantial qualitative benefits that strengthen the region's environmental and educational ecosystem. These impacts will emerge through expanded education and workforce development opportunities, broad community outreach and engagement, cross-sector collaboration, and the production of innovative research that advances river conservation and sustainability.

Education and Workforce Development

The RIVERE Center will strengthen the regional workforce pipeline by integrating education directly into its mission. Through internships, field courses, and immersive training, students from K–12 through graduate programs will be given opportunities to connect classroom knowledge with applied ecological research. In addition, the Center will provide K–12 outreach programming for local schools, engaging thousands of young learners annually in hands-on science.

Peer institutions demonstrate the tangible benefits of such engagement. For example, the Brock Environmental Center in Virginia Beach serves about 2,500 students and teachers each year,⁵ while the Wetlands Institute in New Jersey reaches nearly 13,000 youth annually through “feet-wet” field trips and curriculum-aligned programming.⁶ These programs contribute to a rise in STEM awareness and retention while broadening access for underrepresented groups in science and technology fields.

Community Outreach and Engagement

The RIVERESM Center will also act as a community hub for environmental literacy and stewardship. Through public workshops, guided tours, and citizen science programs, the Center will host a wide array of audiences—families, tourists, local organizations, and international visitors.

Peer institutions illustrate the scale of what is possible. The Brock Environmental Center has hosted more than 30,000 public tours, welcoming 75,000 visitors from 35 countries since opening in late 2014.⁷ The Cedar River Watershed Education Center in Seattle attracts over 30,000 visitors annually,⁸ while the Carrie Murray Nature Center in Baltimore serves roughly 30,000 visitors each year through family programs, school field trips, and outdoor education. With comparable programming and infrastructure, the RIVERESM Center can significantly expand public engagement with river systems and conservation practices.

Collaboration Across Sectors

The RIVERESM Center will encourage collaboration that bridges research, community, and industry. By hosting conferences, symposia, and workshops in its multipurpose facilities, the Center will foster cross-sector partnerships to address pressing ecological challenges. For example, the Brock Environmental Center includes an 80-seat conference room, outdoor classrooms, and exhibit areas that host thousands of K–12 students, educators, and professionals annually.⁹ The RIVERE Center

⁵ Chesapeake Bay Foundation. “About the Brock Environmental Center.” Chesapeake Bay Foundation. Accessed September 2025. <https://www.cbf.org/about-cbf/locations/virginia/facilities/brock-environmental-center/about/index.html>

⁶ The Wetlands Institute. “Environmental Education Field Trip Program.” The Wetlands Institute. Accessed September 2025. <https://wetlandsinstitute.org/education/field-trips/>

⁷ Chesapeake Bay Foundation. “On Third Anniversary, CBF’s Brock Environmental Center Inspires.” CBF Blogs, November 2017. Accessed September 2025. <https://www.cbf.org/blogs/save-the-bay/2017/11/on-third-anniversary-cbfs-brock-environmental-center-inspires.html>

⁸ United Way of King County (Volunteer Portal). “City of Seattle: Cedar River Watershed Education Center.” Accessed September 2025. https://volunteer.uwkc.org/agency/detail/?agency_id=58600.

⁹ “Brock Environmental Center: Case Study.” Whole Building Design Guide. Accessed September 2025. <https://www.wbdg.org/ar/case-study/brock-environmental-center>

can offer a space to convene educators, policymakers, researchers, and industry leaders for joint problem-solving and innovation.

Research Output and Innovation

With its interdisciplinary focus on ecological systems and river health, the RIVERE Center can generate impactful research. As an example of an aspirational peer institution, the Great Lakes Bioenergy Research Center supports more than 400 scientists, students, and staff and brings in about \$25 million in federal funding each year.¹⁰ Within its first twenty years of operation (since 2007), the Great Lakes Bioenergy Research Center has produced 286 patent applications, over 1,800 scientific publications, 117 licenses or options, and five start-up companies.¹¹ By aligning research with regional ecological priorities, the RIVERESM Center will provide actionable science that informs policy, supports conservation, and builds public trust in environmental stewardship.

Property Values

The proposed site for the RIVERESM Center is currently a derelict building that is at best not contributing to nearby property values, and at worst may be having a negative effect. By renovating the property into a state of the art center focused on research, education, outreach, and technology, and with tens of thousands of visitors per year, the Center may spur additional commercial development in surrounding areas. The Center may be expected to positively contribute to property values in the surrounding community.

¹⁰ University of Wisconsin–Madison. “Bioenergy Center’s Research Leads to 100th Patent Application.” *UW-Madison News*, February 25, 2015. Accessed September 2025. <https://news.wisc.edu/bioenergy-centers-research-leads-to-100th-patent-application/>

¹¹ Great Lakes Bioenergy Research Center. “About.” Accessed September 2025. <https://www.glbrc.org/about>