

VIRGINIA SEA GRANT STRATEGIC PLAN, 2018 – 2021.

Sea Grant celebrated its 50th Anniversary in 2016. The National Sea Grant College and Program Amendments Act of 2008, originally passed in 1966, states Sea Grant's objectives are to increase the understanding, assessment, development, utilization, and conservation of the Nation's ocean, coastal, and Great Lakes resources by providing assistance to promote a strong educational base, responsive research and training activities, broad and prompt dissemination of knowledge and techniques, and multidisciplinary approaches to environmental problems. A focus on education, research and training, knowledge transfer, and a multidisciplinary (even inter- and transdisciplinary) perspective remains relevant and needed to address today's coastal, estuarine and marine challenges. However, our educational, research, outreach, and disciplinary landscape has changed dramatically in 50 years and what Sea Grant does, and needs to do, has changed too.

In fact, all aspects of our world are changing and changing rapidly. With change come opportunities. We need ever more innovative answers to increasingly complex coupled social, economic, ecological, technological, and cultural challenges in Virginia's coastal zone. The Commonwealth, region and nation needs Virginia Sea Grant more than ever to produce new knowledge, tomorrow's workforce and businesses, novel solutions that transcend disciplines, sectors and job functions, and to facilitate greater engagement and integration to tackle these challenges. Virginia Sea Grant will rise to the occasion, develop bold, innovative strategies that are transformative, shape an exciting future, and lead. VASG will be at the forefront of what is possible for a Sea Grant program. We will do this through the forward thinking goals, objectives and strategies laid out in this plan. We will be the most innovative and integrated Sea Grant program in the nation, through the proactive leveraging, orchestrating, and nurturing of a diverse, Commonwealth-wide, university-based organizational network. Diversity of expertise, knowledge and perspectives is the essential ingredient to innovation. To enable hunches and ideas to collide and produce innovation, VASG will invest in people, their ideas, skills and capabilities. VASG is proud of the impact and difference our past investments in people have made in the world, and we will continue to be honored by contributions made by future investments.

We will do all of this together, with our partners. Together, we do more for coastal Virginia.

Vision: VASG envisions a future where people live, work, and play along our coasts in harmony with the natural resources that attract and sustain them.

Mission: VASG's mission is to provide transformative, integrated education, research, communication, extension, legal and policy programs, to create the coastal, estuarine and marine innovation workforce and novel solutions to challenges in coastal communities. VASG aims to nurture sustainable, resilient communities through knowledge-informed personal, business, policy, and management decisions.

Science and engineering alone cannot solve the multifaceted challenges Virginia faces in coastal, estuarine and marine communities, particular when science are not adequately engaged with decision-making processes and the citizenry is unaware of the value of science and engineering in their decisions. Further, individual disciplines and even today's multidisciplinary scientific initiatives are at times insufficient, and not always providing effective and feasible solutions given the breadth and complexity of coastal, estuarine and marine challenges. Tomorrow's science will be cross-disciplinary team science that integrates knowledge from multiple perspectives to create novel conceptual frameworks, hypotheses, and methods, and transcends disciplines and sectors. Tomorrow's sustainable, resilient solutions will be highly integrated, collaborative, and transcend jurisdictions, organizations, sectors, and individual occupations. Tomorrow's Sea Grant programs will need to thrive in this environment, to prepare the future workforce to innovate in this environment, and to achieve greater levels of integration across education, research, communication, outreach and extension than ever before.

VASG's strategic plan aligns with and complements the *National Sea Grant College Program Strategic Plan, Charting the course for the future: 2018 – 2021*.

Values and Cross-Cutting Principles: to achieve our vision and mission, VASG is committed to certain operating values, objectives, and cross-cutting principles:

Committed to Sustainability and Resilience

- Advance coastal, estuarine and marine science, research, education and outreach to achieve sustainability and resilience.

Innovative, Cross-Disciplinary Solutions

- Promote identification and exploration of new opportunities for leveraged, synergistic partnerships, and initiatives across the VASG's partner institutions and the Commonwealth.
- Advance the collaboration, coordination, and integration of VASG's capacity in its functional areas (e.g., education and workforce development, research, outreach and extension, communication) in order to achieve broader societal impacts.
- Promote interdisciplinary and transdisciplinary education, research and outreach activities that address pressing coastal, estuarine and marine challenges in the Commonwealth, the region and the nation.

Focus on People and Their Capacity-Building

- Invest in people and provide them with the knowledge and expertise to thrive now and in the future, particularly the graduate and post-graduate Fellows and alumni, who will become future coastal, estuarine and marine science, policy and management leaders.
- VASG is committed to promoting diversity and inclusion in our research, education, communication, outreach and extension activities. Innovation derives from diversity, in all its forms.

Organizational Excellence

- Facilitate the effective development and management of the multi-institutional VASG organizational and knowledge network.
- Commitment to enhancing diversity and inclusion, which are critical to maintaining excellence and spurring innovation.
- Cultivate a reflective practice and an organizational learning culture. Specifically, VASG promotes strategic risk taking and experimentation, monitoring and assessing how our programming works and the difference it makes, and modifying our practice in order to maximize our impact.
- VASG will be a sought-after, respected partner, customer-oriented, and a valued resource to our partners, advisors, and clients.

VASG's core values and principles align and complement the National Sea Grant College Program's values and cross-cutting principles, i.e., cultivating partnerships and enhancing diversity and inclusion.

Scope: VASG will attend to the coastal zone in Virginia and the coastal, estuarine and marine interests in the broader geographic region of the Commonwealth and the National Oceanic and Atmospheric Administration (NOAA), including the Chesapeake Bay and the mid-Atlantic. Further, VASG will work regionally, nationally and internationally, as appropriate, to advance the interests of the Commonwealth and our partners. VASG is committed to fill targeted, critical gaps in the landscape of organizations, capacity, and resources in order to maximize impact, i.e., VASG will seek to address needs not addressed by others.

VASG will invest in people and their places. We will seek to provide them the capacity to be tomorrow's coastal, estuarine and marine science, management, policy, business, and community leaders. Consequently, VASG will focus on graduate students, post-graduates, and undergraduates in a wide range of relevant natural and social science, engineering, law and policy, and other disciplines.

We will serve the private, non-profit, and public sectors and the citizenry. In particular, we will serve local, state, and federal coastal, estuarine and marine resource agencies, the private sector (e.g., aquaculture industries, watermen, seafood processing industries, engineering/architectural and other resilience and

water management industries, and other maritime industries), NGOs, and educational professionals (e.g., K12 teachers, culinary institutes). VASG will invest in the outreach capacity to meet critical, unmet needs among these target audiences.

Strategic Focal Areas below are VASG's primary topical areas of investment and effort, covering the period 2018 – 2021.

WORKFORCE DEVELOPMENT & ENVIRONMENTAL LITERACY

To make a difference, to build tomorrow's collaborative leaders in science, management, policy and communities, and to produce a coastal, estuarine and marine workforce and businesses with substantial competitive advantages, VASG will develop transformational workforce development, coastal, estuarine and ocean literacy, and professional development programming. VASG targets its programming toward specific audiences to achieve the greatest impact. Investing in people, and in students and their professional skills, produces a multiplier effect, extending VASG's impact years after our resource investment.

Most citizens and current students in the United States received little if any in-depth classroom instruction in ocean sciences during their K-12 classroom years. The slow economic recovery and strained state and federal budgets have exacerbated the trend toward reduced federal, state, and local funding for educational efforts. At the same time, there is a tremendous need for an ocean and coastal science literate citizenry and a skilled workforce to serve a rapidly changing and emergent ocean and coastal job market in the private, public and non-profit sectors.

GOAL: A diverse, skilled, and innovative workforce is engaged and enabled to address critical local, regional, and national coastal, estuarine and marine needs.

ACTION: Cultivate a highly competitive workforce through fellowships, internships, and other educational and professional development learning opportunities.

DESIRED OUTCOME: Alumni in highly impactful professional positions nation-wide across public, private and NGO sectors, with competitive advantages due to their professional skills and competencies.

DESIRED OUTCOME: Life-long learning and professional development network composed of current fellows, alumni, staff, and partners, enabling peer mentoring, executive coaching, career development, and collaborative leadership development.

ACTION: Increase participation and inclusiveness of under-represented and diverse groups, disciplines, and perspectives in coastal, estuarine and marine sciences, social sciences, legal and policy studies, and decision-making.

DESIRED OUTCOME: Diverse cohort of fellows, staff, and workforce that is committed to, recognizes, and is capable of leveraging the strengths and innovation potential that comes from diversity.

DESIRED OUTCOME: Team scientists and collaboration-literate fellows, staff, and workforce adept at designing and leading processes to co-produce knowledge and transdisciplinary solutions across sectors, disciplinary, professional, and cultural boundaries.

GOAL: An environmentally literate public that is informed by lifelong formal and informal engagement opportunities, reaching the range of diversity reflected in Virginia's coastal communities.

ACTION: Increase opportunities for undergraduate, graduate, and post-graduate students to gain knowledge and experience in the science and management of coastal, estuarine and marine resources.

DESIRED OUTCOME: College level courses and internships provided increased literacy, experience, and preparedness in areas of coastal, estuarine and marine resources, including students from under-represented groups.

DESIRED OUTCOME: Undergraduate, graduate, and post-graduate groups, including under-represented groups, are supported and have access to formal and experiential learning, training, and research experiences.

ACTION: Increase effective environmental literacy instruction for K-12 educators capable of teaching coastal, estuarine and ocean sciences through both formal and informal education pedagogies.

DESIRED OUTCOME: Easily accessible and useable science-based coastal, estuarine and ocean information and professional development training for classroom teachers, informal educators, and outreach staff.

DESIRED OUTCOME: Strengthened capacity, effectiveness and innovation of coastal, estuarine and ocean literacy, through collaborative research with the learning sciences and engagement with regional and national education organizations and initiatives.

ACTION: Increase effective environmental literacy instruction for key “bridges” between science and end-users, capable of communicating complex scientific and technical information to decision-makers.

DESIRED OUTCOME: Specialized “bridge” audiences (e.g., culinary community and seafood consumers, watermen, aquaculturalists, seafood processors, graduate students, extension staff, post-doctoral staff, and early career scientists) have greater awareness of coastal, estuarine and ocean literacy issues, stronger communication and listening skills, and understanding of stewardship principles.

DESIRED OUTCOME: “Bridge” audiences can employ their knowledge to support sustainable, resilient practices.

RESILIENT COASTAL COMMUNITIES & ECONOMIES

With the greatest level of relative sea level rise on the U.S. east coast and significant historical, cultural, social, economic, and defense infrastructure, Virginia is currently feeling the impacts of climate change and is extremely vulnerable. Adaptation is a necessity on a large scale, although we have pockets of greater vulnerability where the immediate problems are more acute. Virginia has taken action and many organizations, resources, and initiatives have focused on the region. VASG will spark innovation that leads to novel, feasible solutions and community and economic development opportunities that enhance ecological, economic, and sociocultural resilience. We will prioritize serving vulnerable, at-risk and diverse coastal communities throughout coastal Virginia.

GOAL: Coastal communities are aware of changing conditions and risks, and can improve their resilience, economy, and community well-being.

ACTION: Increase key decision maker’s awareness of changing conditions, their impacts, and adaptation options to enhance resilience.

DESIRED OUTCOME: Key decision makers in urban, rural and suburban communities are more aware of their vulnerabilities and opportunities that enhance resilience.

DESIRED OUTCOME: Urban, rural and suburban communities have access to information needed to participate in and conduct adaptive management, planning, and implementation that enhance resilience.

ACTION: Develop and utilize innovative adaptive strategies to enhance community resilience and adapt to natural hazards and changing environmental, economic, and sociocultural conditions.

DESIRED OUTCOME: Expanded and innovative designs, legal, policy, and finance solutions, community engagement opportunities, economic analysis, blue/green economy R&D, and community development strategies are created and shared with communities to advance resilience.

DESIRED OUTCOME: Urban, rural and suburban communities have access to and employ novel legal, policy, green design, and finance strategies to build their resilience.

ACTION: Increase ecological, economic, and sociocultural resilience of coastal communities through diversification, growth, and strengthening coastal and marine economic sectors, particularly the workforce to grow a water management economy.

DESIRED OUTCOME: Virginia universities, including new partnerships with private, public and NGO sectors, are producing the workforce and enabling the businesses needed to adapt and grow a diversified, resilient economy.

SUSTAINABLE FISHERIES & AQUACULTURE

The social, cultural and economic significance of commercial and recreational fishing and aquaculture in Virginia is immeasurable, although the economic value exceeds \$1B annually. Virginians fish, farm, and recreate in the Chesapeake Bay, the coastal lagoons, and the Atlantic. Seafood safety and sustainable fisheries and aquaculture are legacy programs for VASG, with programming address issues from harvest to table cloth, from recreational to commercial, from individuals to small businesses, from efficient industrial production to community-based solutions, and from high-end restaurants to urban and suburban food deserts. VASG will advance the sustainability and resilience of fisheries, aquaculture and the coastal communities that depend upon them through research, education, outreach, and extension services.

GOAL: Fisheries, aquaculture, and coastal, estuarine and marine resources supply food, jobs, and ecosystem, economic and sociocultural values and benefits.

ACTION: Enhance knowledge and technology transfer in domestic aquaculture, and commercial and recreational fisheries.

DESIRED OUTCOME: Increased understanding, and technological and operational solutions aid fisheries, aquaculture, and other coastal, estuarine and marine resource management and production.

DESIRED OUTCOME: Partnerships enable the coastal, estuarine and marine resource industries to adapt and acquire innovative technologies, markets, and business strategies.

ACTION: Promote and support harvest and processing techniques, technologies, and infrastructure that lead to safe, sustainable and high-quality seafood, resilient communities, and ecosystem benefits.

DESIRED OUTCOME: Coastal, estuarine and marine resource industries employ strategies that ensure biosecurity and safe seafood.

DESIRED OUTCOME: Coastal, estuarine and marine resource industries understand and employ strategies and technologies that ensure safe and sustainable seafood supplies and products.

GOAL: Coastal, estuarine, and marine resources are sustained to support fishing communities and industries, including aquaculture, and commercial, recreational, and subsistence fisheries.

ACTION: Ensure sound science, services, technologies, and tools are available and accessible for resource managers, fishing and aquaculture communities, and other stakeholders.

DESIRED OUTCOME: Commercial watermen and fishermen, recreational fishermen, and aquaculturists are knowledgeable about efficient, sustainable, and responsible tools, techniques, and uses of coastal, estuarine and marine resources.

DESIRED OUTCOME: Resource managers, fishing and aquaculture communities, and other stakeholders understand, have access to, and employ knowledge and strategies to adapt to future resource and management conditions.

HEALTHY COASTAL ECOSYSTEM & COMMUNITIES

Healthy Coastal Ecosystems and Communities is central to all of VASG's focal areas. VASG's relevance hinges on demonstrating this connection to healthy coastal ecosystems and communities in everything we do. We attend to the Chesapeake Bay and the coastal and mid-Atlantic and southern North Atlantic Ocean, particularly state and federal waters off the Virginia coast, but also other regions that directly benefit Virginia and its ecosystems and communities. Boundaries are shifting with climate and new partnerships and areas of inquiry are needed to ensure vibrant and healthy coastal ecosystems and communities under these dynamic conditions. Highly integrated and transdisciplinary research, education and outreach efforts are needed to achieve vibrant, healthy coastal ecosystems and communities in the current environment of change.

VASG will invest in people, and support highly relevant research, outreach and extension that fills critical unmet needs on the most pressing coastal, estuarine and marine issues faced by Virginia and our region. VASG will apply its capacity, leverage its partnerships, and convene parties and partners to advance workforce development, literacy, resilience communities, and sustainable fisheries and aquaculture that continue to enhance a vibrant, healthy coastal ecosystem and the communities that depend upon them.

GOAL: Habitat, ecosystems, and the services they provide are protected, enhanced, or restored.

ACTION: Sustain the habitat, biodiversity, and abundance of coastal, estuarine and marine resources and ecosystems.

DESIRED OUTCOME: Coastal, estuarine and marine resources, biodiversity, habitats and ecosystem functions and services are restored and sustained.

DESIRED OUTCOME: Improve collaborative planning and adaptive decision making that enhances sustainability, resilience, and stewardship.

GOAL: Land, water, and living resources are managed by applying sound science, tools, and services to sustain ecosystems that support ecological and human communities and economies.

ACTION: Support a sound science- and management-driven framework that integrates observations, monitoring, research, local knowledge, and modeling to provide a scientific basis for informed decision-making.

DESIRED OUTCOME: Convening and collaboration with partners and stakeholders support planning, research, and innovative solutions to address coastal, estuarine and marine resource management needs.

DESIRED OUTCOME: Communities have access to sound science, data, tools, and the training to be effective participants in decision-making processes.

DESIRED OUTCOME: Resource managers understand the risks, the options, tradeoffs, and impacts of their decisions.

ACTION: Identify and promote strategies that enhance resilient coastal, estuarine and marine ecosystems and watersheds in the context of changing conditions.

DESIRED OUTCOME: Communities have access to information and understand projected changes within coastal ecosystems and how changes will impact coastal, estuarine and marine ecosystems.

DESIRED OUTCOME: Enhanced community capacity to improve planning, preparation and adaptation to future ecosystem conditions.

VIRGINIA SEA GRANT'S PLANNING PROCESS

VASG is a multi-university partnership, forming an agile knowledge network comprised of a broad portfolio of expertise. Our communities of practice, expertise, knowledge, and interests cross both institutional and functional (research, education, outreach, communication) boundaries, and we adhere to rigorous network management principles that seek to optimize innovation, responsiveness, and performance.

VASG is headquartered at the Virginia Institute of Marine Science (VIMS), part of William & Mary (W&M), and composed of the University of Virginia, Virginia Tech, and George Mason, James Madison, Old Dominion, and Virginia Commonwealth Universities – all of Virginia's coastal, estuarine and marine science, technology, engineering, and mathematics doctoral degree-granting institutions. VASG's leadership and advisory structure includes Research & Education Advisory Committee (REAC) with representatives from all of VASG's partner institutions, and the External Advisory Committee (EAC) composed of clients, stakeholders and partners in the public, private and non-profit sectors. The REAC and EAC meet regularly throughout the year. VASG administers its outreach and extension services through four entities – VIMS Marine Advisory Services; Virginia Tech Cooperative Extension, Seafood Agriculture Research & Education Center (AREC); W&M Law School, Virginia Coastal Policy Center (VCPC); and Old Dominion University's Resilience Collaborative. The Extension Portfolio meets quarterly.

Strategic planning is a management tool, and while it produces an output, one of its greatest value is in establishing a culture of openness, transparency, and commitment to on-going dialogue with partners, stakeholders, and staff. VASG will listen—not only during strategic planning, but daily. We will listen to and engage not only those that VASG has worked with for years, but those with whom we have never worked.

In regular REAC and EAC meetings, VASG is continuously reflecting upon the effectiveness of its programming, emerging needs and opportunities, and strategies for making a difference. Thus this strategic plan is a living document; it records a snap-shot in time of VASG's strategic vision, objectives and tactics, but those are continuing to evolve and adapt to the changing conditions.

The notable procedural steps that led to the creation of this plan include:

- March 2015. 1-day Leadership Staff Retreat. Facilitated discusses held in the Innovation & Design Studio of the W&M Mason School of Business.
- July 2015. 1-day joint REAC-EAC meeting, held at the University of Virginia, dedicated to strategic planning.
- September 2015. ½-day Extension Portfolio Quarterly Meeting dedicated to strategic planning.
- September 2015. ½-day EAC meeting, held at VIMS and dedicated to strategic planning.
- January 2016. 1-day, VASG Project Participants Symposium. This is an annual event involving all staff, advisors, funded project leads, mentors and clients, and invited stakeholders. The Symposium is typically attended by ~100 people. VASG hired facilitators from the UVA Institute for Environmental Negotiation, who designed a comprehensive strategic planning process with rotating break-out sessions on each focus area. A final report was produced.

- Summer 2016. Preliminary draft strategic plan was circulated to advisors, staff, and stakeholders for review and comment.
- Two special-issue meetings were held in the summer of 2016 to delve deeper into new, emerging and expanding areas of emphasis in the draft strategic plan:
 - June 2016. VASG partnered with the State Council of Higher Education for Virginia (SCHEV), the Commonwealth's coordinating body for higher education, to convene a ½-day meeting among the state Universities and local stakeholders to discuss gaps, needs, opportunities, and VASG implementation strategies for resilience research, education and design activities in Hampton Roads. There were twenty-two participants from NGOs, local stakeholders, and eight institutions: Hampton University; James Madison University; Old Dominion University; University of Virginia; Virginia Commonwealth University; VIMS, and W&M.
 - July 2016. 1-day REAC meeting, held at George Mason University, to discuss the gaps, needs, opportunities, and VASG implementation strategies for the graduate research fellowship and professional development programming.
- November 2016. Submission of draft strategic plan to National Sea Grant Office.
- November 2016 – January 2017. Online posting of the draft strategic plan and request for broader public comments, including email notifications.
- February 2017. Plan finalized.

CLOSING

VASG aims to have a culture of continuous improvement and learning. We monitor our performance both with nationally reported performance metrics and with operational measures that monitor the effectiveness, structure and function of our organizational network. If VASG is doing its job, it is spurring innovation through the integration of diverse perspectives, knowledge and expertise. Diversity is the essential ingredient to innovation. To enable hunches and ideas to collide and produce innovation, VASG will invest in people, their ideas, skills and capabilities. VASG is proud of the impact and difference its fellows, staff and partners make in the world now and in the future. If you have any further questions about VASG, please visit us at <https://vaseagrant.org/>.