



SCIENCE SERVING MARYLAND'S COASTS

Maryland
Sea Grant
Strategic Plan
2005-2010



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The Strategic Plan summarizes Maryland Sea Grant's goals for the years 2005-2010.

Maryland Sea Grant College, a university-based partnership with the National Oceanic and Atmospheric Administration, is a service organization in the State of Maryland administered by the University System of Maryland; its mission is to conduct a program of research, education and outreach to use and conserve coastal and marine resources for a sustainable economy and environment in Maryland, in the Mid-Atlantic region and in the nation.

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Introduction

The dynamic mix of ecology, hydrology and socioeconomics that defines the Chesapeake Bay — America's largest estuary — presents a set of challenges that are as complex as the estuary itself. Those working toward the conservation, restoration and sustainable use of

Maryland's rich coastal resources not only face increased urbanization in the Bay's watershed but also a gathering public perception that those charged with caring for the Bay have made insufficient progress during the past two decades. The challenges that now face the Bay community urge us to strengthen the ties between science and the actions required to drive positive change leading to the goal of a resilient Chesapeake Bay and healthy coastal areas.

Maryland Sea Grant is poised to respond to the urgent needs of the Chesapeake watershed by developing clear priorities that build upon our position in the academic and Bay communities, on our historical strengths as a cohesive and innovative program, and on our ability to bridge across many constituencies. Our actions will be proactive and gauged to join larger collective efforts focused on our coastal waters. With strong connections to the research and management communities, Maryland Sea Grant will help build a foundation for the sustainable use of coastal resources locally and beyond.

Maryland has many diverse stakeholders, all passionate about coastal resources and the watershed, and many federal, state and local programs directed towards Bay conservation and restoration. Within this context, Maryland Sea Grant's university-based position provides a singular niche. It enables us to maintain a neutral platform and allows for entrepreneurship and the opportunity to work across boundaries to achieve results quickly. Recognizing both the scope and resources of our program, this strategic plan charts a course that will shape our program's research, education and outreach efforts and will guide us as we develop integrated portfolios (see below). All our efforts — from research awards to outreach programs to synthesis and communications products — link the quest for basic understanding with a consideration of the ultimate use of new knowledge.¹

If we are to contribute to effective stewardship of Maryland's coastal resources we must be open to change and must manage our resources wisely. This plan will guide us in making relevant, timely contributions that achieve measurable impacts.

Maryland Sea Grant will engage the scientific and university community to address important coastal issues. We will provide a tangible bridge to decision-makers and will realize important opportunities for effective stewardship of Maryland's coastal resources.

The challenges that now face the Bay community urge us to strengthen the ties between science and the actions required to drive positive change.

¹ Donald Stokes. *Pasteur's Quadrant: Basic Science and Technological Innovation*. Brookings Institution Press, 1997.

A Vision for 2005-2010



Meeting Coastal Challenges

Maryland Sea Grant will shape a cohesive program positioned to anticipate future needs and respond to emerging issues by engaging the talent and resources of the academic and research communities in Maryland and beyond. We will adopt strategies designed to foster program evolution and support adaptive management to meet the challenges of our varied constituencies in the state, region and nation.

To realize this vision, we will use the tools of research, outreach and education in an integrated manner to influence the conservation, stewardship and restoration of coastal resources, generate sustainable economic opportunities, and serve as a highly credible source of information for stakeholders and decision-makers.

Our programmatic vision builds upon our historical foundation as:

- **Leaders.** Sea Grant will take appropriate risks to facilitate innovation and adaptive change through application of nationally eminent research and engagement of the scientific community.
- **Integrators.** Sea Grant will serve as an integrator and communicator of diverse approaches and complex research findings to enhance understanding and empower decision-making.
- **A Neutral Forum.** Sea Grant will provide a neutral forum for the lively discussion of problems, solutions and creative ideas.

Maryland Sea Grant's Mission (2005-2010)

The Maryland Sea Grant College, a university-based partnership with the National Oceanic and Atmospheric Administration (NOAA), is a service organization in the State of Maryland, administered for the University System of Maryland by the University of Maryland Center for Environmental Science. Its mission is to conduct a locally responsive and nationally eminent program to foster research, education and outreach for the sustainable use and conservation of coastal, marine and watershed resources in Maryland, in the Mid-Atlantic region and in the nation.

Programmatic and Organizational Values

Maryland Sea Grant's values reflect a programmatic commitment to serve the needs of a diverse constituency.

We strive to:

- Engage constituencies dedicated to conservation, sustainable use and restoration of Chesapeake Bay and Maryland coastal resources.
- Catalyze the application of preeminent science to fill critical gaps and realize new opportunities.

- Link science to outreach, leading to improved decision-making, new products and new economic opportunities.
- Deliver innovative education for Maryland's citizens of all ages to foster coastal, marine and scientific literacy.
- Adhere to responsible stewardship for all resources allocated to our program in our role as trustees.
- Commit to professionalism and organizational excellence for our stakeholders and respect for our colleagues and their development as individuals.

The Context for Maryland Sea Grant's Plan



The Chesapeake Bay 2005-2010

Perhaps more than in any other part of our country, residents of the Chesapeake Bay watershed have expressed a commitment to actions that will conserve existing resources and ecological functions and return the regional ecosystem of Chesapeake Bay to a better, healthier state. This goal envisions a Bay that supports a diverse, well-functioning ecosystem, a variety of uses and many communities — a Bay that is ecologically and economically resilient.

Since the development of Maryland Sea Grant's last strategic plan, there have been numerous discussions about the state of the Chesapeake Bay and the success of conservation and restoration efforts across the watershed. New perspectives on the importance of watershed processes and their impact on the Bay as a whole have emphasized the relationships between landscape changes and responses in the coastal ecosystem. Many of these discussions have focused attention on a collective vision for a future Chesapeake Bay. These discussions have also been framed by ongoing debates on the degree to which progress has been made in achieving goals articulated by the broad community. These debates have been sharpened by a clear observation of the interaction between cycles of drought and flood and anthropogenic changes — rural and urban or local and global — across the Bay watershed.

The Chesapeake Bay's broad watershed — approximately 166,000 square kilometers — lies within the larger context of the nation's coastal resources. Landmark reports issued recently by the U.S. Commission on Ocean Policy² and the Pew Oceans Commission³ accentuate the need for innovative science and outreach as well as far-reaching governance changes. Both commissions highlight the need for regional-scale activities that acknowledge and address the ecosystem-wide basis of coastal issues.

² *An Ocean Blueprint for the 21st Century: Final Report of the U.S. Commission on Ocean Policy*, July 2004.

³ *America's Living Oceans: Charting a Course for Sea Change*. Final Report of the Pew Oceans Commission, May 2003.

Science for Stewardship, Restoration and Economic Opportunity

The landmark *Chesapeake 2000* Agreement (C2K)⁴ set ambitious goals for restoration of the Chesapeake Bay. Central to this effort is the commitment to correct nutrient and sediment-related threats to the Bay and its tidal tributaries by 2010. Although progress has been made in some areas since C2K was implemented, a realistic assessment shows that much remains to be done and that significant scientific gaps remain. As the community's understanding of the complex interaction of anthropogenic and climatic factors grows, it is clear that effective adaptive management will be needed to realize further progress.

Positive ecological change in the Chesapeake Bay will depend on the ability to integrate the best scientific information available with a dynamic policymaking and implementation process. Chesapeake Bay's long-standing and extensive structures for regional decision-making have become particularly important as environmental pressures from anthropogenic stressors within the watershed continue to mount.

Now well-respected roadmaps are available to steer policymaking efforts. The *Chesapeake Futures*⁵ effort, for example, provides a guide for our thinking and

Resilience and Adaptive Management

Ecosystems like the Chesapeake Bay are dynamic, changing from season-to-season and year-to-year. But the overall state of the ecosystem, whether it has clear water and abundant submerged aquatic vegetation or turbid water and copious algae, can be very resistant to change. Resilience is a measure of the ability of an ecosystem to withstand perturbation without a fundamental change in state. Resilience is what allows an ecosystem to recover from a storm, but it is also what makes it difficult for management efforts to “flip” that system out of an undesirable state and into a more desirable one.

The concept of resilience has helped Maryland Sea Grant frame its thinking about a restoration trajectory for the Bay. Since Hurricane Agnes in 1972, the Chesapeake Bay has been in a state dominated by algae, low dissolved oxygen, and murky waters. Mounting an effort to fundamentally change the state of the Bay into something that more closely resembles the Bay of the past requires a management approach that is driven by how well the ecosystem itself responds to those efforts. “Adaptive management” is a process that matches input with response and re-evaluation to measure whether the actions engender the desired effect. This approach seeks to integrate multiple techniques and disciplines — from natural to social sciences — in planning, implementation and evaluation. It aims to learn from stakeholders and from the outcomes of operational programs in an iterative manner that leads to more effective conservation and restoration of resources over time.⁶

⁴ *Chesapeake 2000: A Watershed Partnership*. Chesapeake Bay Program.

⁵ *Chesapeake Futures: Choices for the 21st Century*. U.S. EPA Chesapeake Bay Program Scientific and Technical Advisory Committee. D. Boesch and J. Greer Eds. January 2003.

⁶ Walters, C. 1997. Challenges in Adaptive Management of Riparian and Coastal Systems Conservation Ecology [online] 1(2):1; Gunderson, L. 1999. Resilience, Flexibility and Adaptive Management: Antidotes for Spurious Certitude; and National Research Council. 2004. Adaptive Management for Water Resources Project Planning.

management efforts as we journey through the first three decades of the 21st century. This exercise outlines the likely consequences of some of the choices we are making now, and their implications for the future of the Chesapeake Bay. *Chesapeake Futures* poses three scenarios — maintain the status quo, meet current objectives or adopt a more aggressive, but achievable, action strategy — for conservation and restoration of the Bay and its watershed. All these scenarios will require difficult choices — choices that will affect our collective lifestyle and test our commitment and political will — if we are to succeed. Clearly, all three scenarios will incur costs. Recently, an eminent panel of experts developed estimates of what the implementation of C2K would cost the region. The Chesapeake Bay Watershed Blue Ribbon Finance Panel Final Report details a \$15 billion funding gap and a series of strategies to overcome it.⁷

Linkages with Our Partners

Maryland Sea Grant recognizes that to best use our programmatic strengths, we must draw insights from important high-level analyses of Chesapeake Bay and from similar studies of our coastal resources nationwide. Furthermore, we must ensure that there is appropriate articulation of our priorities with those of relevant entities at the federal, state and local levels. There are several strategic plans that must be considered as context for this plan as we seek opportunities where we can contribute both singularly and in partnerships. In doing so, we more clearly define our niche in this complex programmatic and institutional environment.



- **Strategic Plans of Agencies and Institutions.** Acknowledging the essential federal-state partnership that forms the foundation of our efforts, Maryland Sea Grant’s strategic plan must articulate well with that of the National Oceanic and Atmospheric Administration (NOAA) and its office of Oceanic and Atmospheric Research (OAR), and more specifically with that of the NOAA National Sea Grant College Program. More locally, our program exists within a dynamic academic and research environment supported by the University System of Maryland, the University of Maryland Center for Environmental Science and the University of Maryland College Park in service to the entire state. Our “effectiveness” must be based on an understanding of the priorities and strengths of these institutions if we are to make the connections needed to develop lasting impacts in critical areas.

⁷ *Saving a National Treasure: Financing the Cleanup of the Chesapeake Bay*. Final Report of the Chesapeake Bay Watershed Blue Ribbon Finance Panel, October 2004.

- **NOAA Strategic Plan.** This agency-wide plan designates four broad mission goals. To achieve each of these goals the agency has established strategies and crosscutting functional approaches. The first of NOAA's mission goals: "Protect, Restore and Manage the Use of Coastal Resources through Ecosystem-Based Management" lies closest to the core of Maryland Sea Grant's overall mission. However, we will seek to address the remaining mission goals in appropriate ways consistent with the priorities articulated for us by our stakeholders. In a functional context, the NOAA-wide strategies are closely matched to our own activities at the local and regional levels and are well integrated into our plan — as are many of the crosscutting themes that NOAA has embraced.

- **The NOAA National Sea Grant Office Strategic Plan.** This "programmatic strategic plan" reflects the set of broad themes that have been developed as organizing principles and implemented by the Sea Grant Network over the past five years. In our case, these thematic areas provide a context for linking our local priorities to those of other programs across the nation. For clarity, we coalesce the 10 thematic areas into a smaller set of functional groupings that allow MDSG to sort and track our efforts while still employing the common structure of themes adopted by all programs nationwide. Our program will contribute these themes and the associated theme teams in a variety of ways. At any given time, however, the apportioning of our investments will vary depending on priorities and need within the state and region. The integrated approach embraced by the Sea Grant Network in developing and implementing the theme team concept is entirely consistent with Maryland Sea Grant's portfolio approach and investments that engage all our programmatic resources.

- **University Strategic Plans.** Recent analyses of metrics for science and engineering by the National Science Foundation⁸ demonstrate that Maryland is among

NOAA-Wide Strategies

- Understand and Describe
- Engage, Advise and Inform
- Assess and Predict

NOAA "Cross Cuts"*

- Sound State-of-the-Art Research
- Environmental Literacy, Outreach and Education
- Organizational Excellence

*Those most relevant to MDSG

NOAA-Wide Mission Goals

- Protect, Restore and Manage the Use of Coastal and Ocean Resources through Ecosystem-Based Management.
- Support the Nation's Commerce with Information for Safe, Efficient and Environmentally Sound Transportation
- Understand Climate Variability and Change to Enhance Society's Ability to Plan and Respond
- Serve Society's Need for Weather and Water Information

⁸ *The National Science Board*. 2004. National Science and Engineering Indicators.

the most research-intensive states in the nation. Maryland is consistently within the first quartile for all states in the granting of undergraduate and advanced degrees in the sciences. State spending on R&D and the contribution of R&D — both as a percentage of the gross state product — are also among the highest nationwide. Finally, the output of the academic community in Maryland is also within the top quartile.

Together, these indices paint a clear picture of a state and economy that place high value on the research enterprise, with an abundance of talent that can be brought to bear on key issues. This presents both tremendous opportunities and challenges for the academic community and programs like Maryland Sea Grant. These facts are central to the strategic plans of the academic institutions that support Sea Grant. At the broad level of the University System of Maryland, a fundamental focus on Maryland's "knowledge-based economy" places priority on the creation and use of knowledge "to advance the state's economy and to improve the quality of life for Maryland's residents." In addition, the effort to educate, prepare and retain and enhance K-12 teachers is a central mission.⁹

The University of Maryland College Park and the University of Maryland Eastern Shore are the two Land Grant campuses within the University System. These institutions have embraced a strategy and vision that highlights the importance of engagement, partnerships, collaboration and multidisciplinary efforts to reach and impact the greater community.¹⁰ Maryland Cooperative Extension (MCE) operates as a seamless program of professionals, some of whom have joint appointments between the two campuses, and partners with Maryland Sea Grant to provide extension services statewide. MCE has implemented actions to advance environmental stewardship of Chesapeake Bay and its watershed, to build greater economic opportunities for Maryland's residents and to foster quality educational opportunities for all learners.¹¹

The University of Maryland Center for Environmental Science (UMCES), Maryland Sea Grant's administrative home, has acknowledged the challenges of restoring and managing Chesapeake Bay and has set forth a plan that focuses on four strategic areas, two of which are most important to Maryland Sea Grant's mission — science

National Sea Grant Network Theme Areas

- **Coastal Processes and Ecosystem Responses**

- Ecosystems and Habitats*
- Digital Ocean*

- **Natural Resources of Coastal Maryland**

- Fisheries*
- Aquaculture*
- Seafood Science and Technology*
- Marine Biotechnology*

- **Maryland's Coastal Communities and Economies**

- Coastal Communities and Economies*
- Coastal Natural Hazards*
- Urban Coasts*

- **Education**

- Marine and Aquatic Science Literacy*

⁹ *The USM in 2010: An Update of the USM Strategic Plan, 2004.*

¹⁰ *Building on Excellence: The Next Steps The Strategic Plan for the University of Maryland, College Park 2003, University of Maryland Eastern Shore, Strategic Plan, 2004.*

¹¹ *Extension at the Crossroads: Mapping Our Future. MCE Strategic Plan, 2003.*

to support ecosystem-based management and multi-scale ecosystem restoration. In adopting a science and education strategy that casts local impacts within a national and international context, UMCES engages and supports many efforts statewide. In total, these plans provide a strong foundation for our own efforts. Also part of the larger context are the plans of our other institutional partners within the University System of Maryland (e.g., University of Maryland Biotechnology Institute) and the broader academic community (e.g., Johns Hopkins University, Smithsonian Environmental Research Center and Morgan State University).

Plans from Local and Regional Programs. Coordination and effective partnering is critical in the Chesapeake Bay, where there are many federal, state and local entities that have interest and capacity relevant to Maryland Sea Grant's mission and goals. Clearly the Chesapeake Bay Program and the overarching *Chesapeake 2000* goals provide a strong context for our collective activities. In this regard, several programs are particularly important as partners and collaborators. These include the Maryland Coastal Zone Program whose goals of sustainable coastal ecosystems and communities align well with our own. Similarly the NOAA Chesapeake Bay Office with strategic foci linked closely to the *Chesapeake 2000* goals is another important partner. Close linkages and coordination with Sea Grant programs in Virginia and Delaware will continue to insure greater leveraging of funds for broad regional impacts. Examination of the plans of our sister programs reveals considerable congruity, particularly with joint emphases on understanding ecosystem processes, sustainable fisheries and education. We also recognize the importance of non-governmental organizations as critical advocates for conservation and restoration of the Bay and its watershed, and the opportunity to join in mutually beneficial partnerships.

Building Regional Sea Grant Capacity

Maryland Sea Grant intentionally shifted its two-year funding cycle to synchronize with the funding cycles of neighboring Sea Grant programs in Delaware and Virginia. In 2004 Maryland, Delaware and Virginia Sea Grant coordinated a joint solicitation for regional proposals focused on specific issues. We will continue to solicit, encourage and support projects that address regional needs in coordination with our Mid-Atlantic Sea Grant partners.

Our long-term success will depend in great part on our ability to be "nimble" and to seek ways to leverage activities and to create synergistic interactions among these strong partners.

The Planning Process

The goal of our strategic planning effort has been to develop clear priorities that reflect the input of a broad distribution of our stakeholders across the state. We have coupled this with a detailed internal analysis designed to enfranchise all members of Maryland Sea Grant in an inclusive and open manner. Procedurally the planning process has spanned about 18 months and has included the following steps:

- **Internal Retreat.** This intensive two-day meeting brought together all of Maryland Sea Grant staff to discuss basic aspects of our program including our collective vision, our strengths and weaknesses.

- **Stakeholder Analysis and Database Construction.** The program met to develop a detailed listing of our external stakeholders and to develop a large database that includes individuals from many different communities (academic, business, education, etc).

- **Research Planning Meeting.** This full-day meeting brought together key members of our research and management communities to discuss new directions and priorities for our research effort. A central goal of this effort was to develop a more refined vision of what Maryland Sea Grant can “realistically” contribute with its resources and where critical gaps need to be filled. This meeting was pivotal in reaching a consensus that the program should narrow its focus to catalyze research in support of restoration of the Bay. In addition, the far-ranging discussions that took place helped to shape our strategic planning survey.

- **Stakeholder Survey.** This survey was developed — with substantial input from our planning meeting — by the senior staff at Maryland Sea Grant. Based upon direct input and a synthesis of various strategic plans and research needs assessments, Maryland Sea Grant formulated an on-line survey vehicle that was distributed to approximately 1600 individuals. The return rate was approximately 12 percent. We analyzed these data to help establish priority areas that will form the foundation for our activities in the next five years. To see survey results, visit the web at www.mdsg.umd.edu/strategicplan.

Our planning process challenged the program to identify broad strategic goals, each with a series of more specific sub-goals. By design, there is considerable “cross-talk” between these foci — representing the true interdisciplinary nature of the issues that face coastal Maryland. These strategic goals represent a synthesis of local and regional needs with clear recognition of, and guidance from, the national strategies articulated by the National Sea Grant College Program and the NOAA Strategic Plan.

By undertaking this synthesis, we recognize that our challenge is to bridge local and national priorities and, in so doing, demonstrate how Maryland Sea Grant can best serve the needs of our constituents and best fulfill our federal mandate as a program.

Designing for Programmatic Impact

Strategic Management

The role of program management is to engage the diverse talent of Maryland’s academic and scientific communities in conjunction with the resources and capabilities of our program. In so doing, Maryland Sea Grant provides a bridge linking this expertise to a broad group of users. A bridge implies a two-way exchange, and Maryland Sea Grant will actively facilitate this intellectual commerce.

We manage our program as a series of portfolios that orchestrate available resources, tools and approaches to address targeted issues. We stress the impor-

tance of active, productive partnerships, open lines of communication, and willingness to leverage input and resources from many quarters.

Prioritizing efforts to construct effective portfolios requires opportunities and investments to be “filtered”¹² through several levels of questions that reflect overarching programmatic considerations and their potential impact. To identify appropriate issues and rank their importance, Maryland Sea Grant considers the following questions to be first steps in priority setting:

- Does the issue fall within Maryland Sea Grant’s mission and would it be an appropriate university-based activity?
- Is the issue important to the region and to the program’s stakeholders?
- Will the contribution stem from innovative science and is there reasonable probability that significant progress can be made within the typical funding limitations of Maryland Sea Grant?
- Will Maryland Sea Grant support a meaningful contribution toward addressing the issue with a demonstrable application and impact? Will the issue remain “unaddressed” without our involvement?
- Is the talent and expertise available in Maryland or in the region to address the issue? Would Sea Grant support enhance, directly or indirectly, the talent base for marine and coastal issues?

Specifically, through funded research, scholarship and synthesis, we will play a leadership role in the application of the most forward-thinking science to the sustainable use, conservation and restoration of the Chesapeake Bay and to the broad advancement of coastal, marine and watershed research.

By acting as an integrator, we will bring researchers, users, managers and others together to address key issues and to synthesize information into neutral and objective forms for use by the larger community — integrating scientific research with outreach efforts and policy analysis.

Because Sea Grant has neither regulatory nor rule-making responsibility, we will use our strong position to provide a balanced, neutral platform for sharing ideas. This allows us to serve as an honest broker to help resolve emerging resource

Investing in Issues: The Portfolio Approach

This program has chosen the term “portfolio” to reflect investments made in priority areas. Each portfolio includes a linked set of activities — whether research, outreach, education or all three — brought to bear in a concerted fashion to achieve effective resolution of important issues. This portfolio approach allows the program to marshal a diversity of assets to address key challenges and opportunities, and draws on the varied strengths of the Sea Grant community in an efficient and synergistic manner.

¹² Adapted from *Oregon Sea Grant — Strategic Plan 2004*.

conflicts. We will work to make this platform available when appropriate to aid in solving difficult resource issues.

Targeted Capacity

The difficult choices facing the Chesapeake watershed underscore the importance for Maryland Sea Grant to apply its resources strategically — in a manner that matches our capacity to achieve substantive impacts. Similarly we should be entrepreneurial and seek funding for activities that are realistic, logical extensions of our skills into new areas and that build upon strong partnerships with the institutions we serve.

- **Science.** Maryland Sea Grant has sustained a long-term effort to provide a better understanding of the fundamental mechanisms that regulate estuarine function and response to anthropogenic influences. This high quality science has helped to “define” Chesapeake Bay and has served to clarify how estuaries function worldwide. With a proven ability to identify and implement research that fills critical knowledge gaps, Maryland Sea Grant is well positioned to make important contributions to the conservation and restoration of Chesapeake Bay and Maryland’s coastal waters.

- **Policy.** Innovative links forged between the scientific community and decision makers through outreach are fundamental to Maryland Sea Grant’s mission. The demand is growing for clear, unbiased information to help shape conservation, restoration and policy development. Maryland Sea Grant stands at the forefront of providing translation and syntheses that will be needed in the coming years. As the community comes to grips with the reality of what conservation and restoration will require, Sea Grant must remain a strong highly credible source for information and facilitation.

- **Community.** New economic opportunities, stronger communities and educational resources will be critical in conserving and restoring the Chesapeake watershed. Maryland Sea Grant’s commitment to innovative extension and education programming has positioned us to be leaders in the development of evolving but sustainable communities that are effective stewards of our coastal resources.

- **Cooperation.** Confronting watershed conservation and restoration will require strengthening regional alliances and fostering cooperation and coordination that goes beyond state boundaries. Maryland Sea Grant’s commitment to working with our neighboring Sea Grant programs and the broader community in the Mid-Atlantic and nation as a whole positions us to be a strong active participant and leader in regional initiatives.

Acronyms

NOAA – National Oceanic and
Atmospheric Administration

OAR – Oceanic and
Atmospheric Research

NSGO – National Sea Grant
Office

USM – University System of
Maryland

MCE – Maryland Cooperative
Extension

UMCES – University of
Maryland Center for
Environmental Science

Charting an Effective Strategy

Maryland Sea Grant operates in a complex programmatic and institutional environment, populated with efforts that have evolved to pursue conservation and restoration of the Chesapeake Bay and Maryland's coastal waters.

Our expertise in the support and interpretation of scientific inquiry positions us to make strong contributions in both research and outreach.

Our expertise in the support and interpretation of scientific inquiry positions us to make strong contributions in both research and outreach. At the same time, our size and scope demand that we be selective in choosing issues and targeting resources. This strategic plan provides us with a clear roadmap and emphasizes the importance of fostering preeminent scientific contributions — contributions that can, through a variety of mechanisms, inform and influence the policymaking process. Defining and filling critical knowledge gaps and conveying information to those engaged in the adaptive management of Maryland's coastal resources builds upon the historical strength of this program and will continue to position us to be leaders in the coming years.

As part of its scientific synthesis and outreach functions, Maryland Sea Grant has a clear mandate to provide strong educational programming to help inform and empower coastal stewards. Through carefully thought-out and well-directed efforts we can impact constituents in ways that extend across the watershed as well as across generations. The next five years will present many challenges to the region's coastal resources and coastal residents. Maryland Sea Grant will work to meet these challenges through innovation, collaboration and commitment.

The specific strategic goals and subgoals that follow synthesize the advice of our stakeholders and partners and define a niche for our program that mobilizes all of our resources and capabilities in an integrated manner. These subgoals fall under four major areas:

- Coastal Processes and Ecosystem Responses
- Natural Resources of Coastal Maryland
- Education
- Maryland's Coastal Communities and Economies

The tangible efforts that will fulfill the mission and goals set forth in this document are described in Maryland Sea Grant's Implementation Plan, a tactical blueprint that details concrete benchmarks for action. In the Implementation Plan, for example, one will find specific research projects targeted to particular areas of interest, whether in improving our understanding of how coastal ecosystems function or in examining how a particular species of fish or shellfish may react to changing environmental conditions.

The Implementation Plan also outlines specific educational, outreach and policy-related activities aimed at delivering much-needed information to a range of stakeholders, including decision-makers. For a copy of Maryland Sea Grant's current Implementation Plan contact the Office of the Director, Maryland Sea Grant College, 4321 Hartwick Road, Suite 300, College Park, Maryland 20740, or call 301-403-4220.

Maryland Sea Grant's Strategic Goals 2005-2010

1. Coastal Processes and Ecosystem Responses

Scientists recognize that the Chesapeake Bay has experienced a profound functional shift from an ecosystem dominated by benthic processes to one driven by production in the water column. Urbanization and large-scale changes within the watershed are primary contributors to an ecosystem functionally impaired by excess nutrients and sediments — impairments evident in the water quality of Maryland coastal and freshwater systems, and in their habitat structure and biodiversity. The impacts of anthropogenic loads occur within the context of changes in broad hydrological cycles. This complex interaction poses fundamental challenges to those seeking to manage the estuary and watershed. Achieving a sustainable Chesapeake Bay will require science-based decisions that must consider how and when conservation and restoration efforts can be most effective. Ultimately, restoration will create a dynamic Bay that reflects the reality of what can be accomplished in meeting specific criteria rather than one that reflects an idealized vision of a Bay of the past. Therefore, there is a fundamental need to understand what a “new” ecosystem might look like, how it might function, and how the current system will evolve as management actions are implemented.

Maryland Sea Grant will address the issue of conservation and restoration by considering key coastal processes and ecosystem responses as existing nutrient and sediment reduction goals are achieved and maintained over time. In this way, the program will provide critical information to help determine the temporal and spatial scales over which actions will be effective and the trajectories that the ecosystem may follow once actions are initiated. Key to this effort is the goal of developing and communicating a better understanding of the thresholds that the ecosystem will cross as it shifts to new stable states.

Subgoal 1.1 Ecosystem Process and Response	1.1a Understand and predict large-scale ecosystem responses and trajectories.	1.1b Understand how a changing Bay impacts specific food web dynamics.	1.1c Determine how keystone species respond to change and management.	1.1d Understand the relationship between changes in anthropogenic loads of nutrients, sediments and contaminants and ecosystem health.	1.1e Understand the relationship between changes in anthropogenic loads of nutrients, sediments and contaminants and fisheries resources.
Subgoal 1.2 Scientific Foundations for Ecosystem Restoration	1.2a Determine and target obligate ecological functions for conservation, management and restoration.	1.2b Determine how key ecological communities respond to conservation and restoration efforts.	1.2c Determine and predict how restoration efforts will affect changes in water quality parameters including nutrients, sediments and contaminants.	1.2d Determine how anthropogenic influences including nutrient, sediment and contaminant loading affect restoration efforts and their likelihood of success.	1.2e Develop better indicators of restoration success and/or failure.

2. Natural Resources of Coastal Maryland

Research to support the implementation of ecosystem-based management of critical natural resources is integral to building a comprehensive approach to conservation, restoration and sustainable use of Maryland's coastal resources. Success will require adaptive management that embraces sound policies for sustainable use as well as emerging technologies. Aquaculture, along with a suite of novel applications for engineering and biotechnology, may help reduce pressure on Chesapeake Bay resources as well as catalyze new uses leading to economic development and jobs.

Maryland Sea Grant will address the issue of conservation and restoration by considering how best to support innovations in the science and application of ecosystem-based management and sustainable use of Maryland's coastal resources.

<i>Subgoal 2.1 Scientific Foundations for Conservation and Restoration of Natural Resources</i>	2.1a Develop better measures of natural resource performance and carrying capacity.	2.1b Develop a better understanding of targets for and roadblocks to natural resource restoration (SAV, habitat, critical species).	2.1c Understand current and emerging diseases in key species.
<i>Subgoal 2.2 Sustaining Commercial and Recreational Fisheries</i>	2.2a Support ecosystem and multi-species fisheries management.	2.2b Develop a better understanding of recreational fishing impacts on key species.	2.2c Develop a better understanding of the utility of marine protected areas in Maryland coastal waters.
<i>Subgoal 2.3 Sustainable Use of Natural Resources</i>	2.3a Support for the appropriate use of aquaculture in restoration of natural resources.	2.3b Develop a better understanding of the economic opportunities of aquaculture and biotechnology and employ these tools to realize new opportunities for sustainable production of coastal and marine products.	2.3c Develop new and better strategies and technologies for bio- and phyto-remediation and mitigation of stressors.

3. Education

An informed public is essential in developing sustainable uses of coastal resources. Education spanning multiple levels, from K-12 to higher education to environmental managers and the general public, will play a central role in developing the capacity to understand issues in the coastal zone and the ability to make well-informed decisions based on unbiased information. Maryland's economy is increasingly becoming "science-based," and the chance to grasp new opportunities will therefore require not only technical literacy but an appreciation of — and a sense of comfort with — the tools of the scientific method.

Maryland Sea Grant will address the issue of conservation and restoration and the state's education needs by advancing innovative programs directed to inform diverse publics in ways that catalyze critical thinking and synthesis and lead to long-term stewardship of coastal resources.

<i>Subgoal 3.1 Information for Managers and Coastal Decision-makers</i>	3.1a Enhance, tailor and accurately target educational products and efforts to the needs of coastal decision-makers.	3.1b Increase the effectiveness of information and synthesis for coastal managers/decision makers.
<i>Subgoal 3.2 K-12 Learners and Teachers</i>	3.2a Develop content, lessons and curriculum enhancements focused on coastal and watershed issues.	3.2b Enhance and expand research experiences for K-12 teachers.
<i>Subgoal 3.3 University Students</i>	3.3a Enhance research fellowship funding and opportunities.	3.3 b Develop and market research internships for undergraduates.
<i>Subgoal 3.4 Non-Traditional Stakeholders</i>	3.4a Develop partnerships and programs that diversify traditional stakeholder groups	
<i>Subgoal 3.5 Free Choice Learning and Emerging Opportunities for Public Education</i>	3.5a Develop interactive displays, exhibits and programs in partnership with new venues (aquaria, visitor centers and museums).	3.5b Develop content and materials for non-coastal/watershed publics.

4. Maryland's Coastal Communities and Economies

Restoration and sustainability mean different things to different interest groups or stakeholders. "Conservation," "preservation," and "community" all connote different images and realities for residents of the Bay watershed. Traditional drivers such as commercial fishing and agricultural patterns in coastal communities are changing. Policy choices and other factors leading to different or new economic opportunities exert great influence and yield changes in traditional communities. As restoration moves ahead, many communities may be forced to adjust to change while balancing the desire to preserve a sense of place.

Maryland Sea Grant will address the issue of conservation and restoration by considering the socioeconomic implications of the changing watershed on coastal communities and economies and will advance dialog and positive engagement of diverse stakeholders.

Subgoal 4.1 Develop Tools for Improved Coastal Management	4.1a Support and provide conflict resolution for multiple use issues in coastal communities.	4.1b Foster development and use of new tools for sustainability in coastal communities.	4.1c Develop a better understanding of socioeconomic implications of environmental change and efforts to restore the Bay.	4.1d Understand the impact of nutrient loading on human use of the ecosystem.
Subgoal 4.2 Sustainable Coastal Land Use and Restoration	4.2a Foster the development of new environmentally sustainable options for shoreline stabilization and restoration.	4.2b Develop a better understanding of dredging impacts and better dredged material placement options.	4.3c Examine new technologies to prevent nutrient and sediment loading within the watershed.	4.3d Examine new technologies for remediation.
Subgoal 4.3 Fostering Sustainable Coastal Economic Development	4.3a Support sustainable fisheries-dependent and seafood processing technologies.	4.3b Support improved understanding of the role of marine-dependent industries on the sustainability of coastal economies.		