

**The Chesapeake Bay Restoration Trust Fund:
Implementing a Sustainable Investment Strategy**

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by

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Executive Summary

State leaders in Maryland have taken a bold step in their efforts to restore the Chesapeake Bay. With the passage of the Chesapeake Bay Restoration Trust Fund Act of 2007 (Trust Fund), they have laid the foundation for an ambitious strategy for restoring and protecting the Bay. The creation of the Trust Fund, and the decision to capitalize it at the rate of \$50 million per year, further positions Maryland as a regional and national leader in valuing and protecting critical natural resources. The opportunity now exists for the state to use the Trust Fund to implement an efficient and effective investment strategy. To implement this strategy, we recommend that the state pursue two key approaches in the financing process:

- First, we recommend that the state develop a financing approach that provides flexibility, capacity, and efficiency in the investment process. The core focus of this approach should be to invest in performance, effectiveness, and efficiency rather than focusing on supporting existing programs.
- Second, we recommend that state leaders aggressively pursue opportunities to support research and development of new innovations and technologies that will provide long-term benefit to the restoration effort.

Introduction

The Trust Fund represents a major step forward in the State's efforts to finance the restoration programs. The \$50 million per year will provide an excellent foundation for supporting nonpoint-source best management practices. The scale of the problem, however, will require the state to invest the money in a way that will attract more capital and revenue to the restoration effort.

Leaders throughout Maryland and the Chesapeake Bay watershed are at a critical point in efforts to protect and restore one of the most remarkable natural resources in the world. For the past 30 years, leaders have committed significant resources to study threats to the Bay and its tributaries, to identify restoration opportunities, and to assign restoration responsibilities. By now, the threats to the Bay and the human activities that adversely impact water quality are well documented. Sediment and excessive nutrients from wastewater treatment plants, farm fields, septic systems, urban lands, and from air deposition are degrading habitat and depleting oxygen levels in the Bay, putting stress on the myriad species that live in the estuary and its tributaries. By detailing the physical changes on the land necessary for protecting and restoring the Bay, the Tributary Strategies establish restoration and protection goals for Maryland and each of the other Bay jurisdictions. What is thus far lacking, however, are comprehensive strategies for funding and financing the implementation process.

Though the Tributary Strategies provide state leaders with a roadmap for restoring and protecting the Chesapeake Bay and its watershed lands, the associated costs will prove a significant barrier to implementation. In fact, it is estimated that Maryland faces a budget shortfall of approximately \$5.4 billion to meet its Tributary Strategy goals. Overcoming this barrier will require local, state, and federal leaders to look beyond traditional funding programs and tools and to develop effective, sustainable, market-based and incentive-based financing strategies.

The new Trust Fund will enhance the state's financing strategy by supporting programs, projects, and best management practices that effectively reduce nonpoint-source emissions of

nitrogen, phosphorus, and sediment. Coupled with other financing tools and programs such as the Chesapeake Bay Restoration Fund (Flush Tax), the Trust Fund provides state leaders with a tremendous opportunity to ensure the long-term protection of the Chesapeake Bay. Taking full advantage of this opportunity will require the state to overcome some significant obstacles, however, including the anticipated high costs associated with implementing all of the state's obligations under the Tributary Strategies.

The Scale of the Problem

To achieve the State's restoration goals and obligations will require anywhere from \$200 - \$600 million annually in revenue. Though the \$50 million per year is important, it is not nearly sufficient in and of itself. Therefore, the Trust Fund should be considered a fundamental piece of a broader financing and implementation strategy that focuses on permanently restoring and protecting the Bay. Three key components of that strategy should be: improving the State's institutional capacity to invest fiscal resources; ensuring an equitable, effective regulatory strategy and framework; and, implementing investment strategies that advance and support innovation, performance, and efficiency.

The State of Maryland has agreed to reduce pollution loadings to the Chesapeake Bay to 37.3 million pounds per year of nitrogen, 2.9 million pounds of phosphorus, and 0.7 million tons of sediment by the year 2010.¹ Based on existing programs and initiatives, state officials have estimated a \$5.4 billion revenue gap associated with reaching these goals. Coupling on-going operations and maintenance costs to annual capital costs would result in an annual funding obligation of \$652 million. Most of these costs are associated with managing and mitigating the impact of nonpoint-sources of nutrients and sediment. In short, though the Trust Fund is a very important step in the financing effort, it is not nearly sufficient to address all of the gaps that exist in the State's financing strategy.

	Total Load in 2002 (million lb per yr) ²	Capital Costs ³	Annual Capital Costs	Annual Operations & Maintenance	Total Annual Costs
Agriculture	22.14 N / 1.70 P	596	57	25	82
Stormwater Management	8.97 N / 0.95 P	1,296	125	61	186
Wastewater - Point Source	14.96 N / 0.80 P	250	24		24
Wastewater - On Site	3.42 N / 0.00 P	2,656	256	104	360
	49.49 N / 3.45 P⁴	\$4,798	\$462	\$189	\$652
Total Costs:	\$5,450 billion				

Source: Maryland Department of Natural Resources

In short, even with the establishment of the Trust Fund and the decision to capitalize it at the rate of \$50 million per year, success will require state leaders to establish the Trust Fund as a restoration financing tool, as opposed to a funding tool. The distinction between the two is significant.

The purpose of finance is to maximize the value of the community's investment. A comprehensive investment and financing strategy should be predicated on the interaction of

four key elements and processes: 1) allocating and leveraging public and private capital; 2) developing effective, efficient institutions and institutional capacity necessary for implementing the financing process; 3) developing an equitable, effective regulatory framework; and 4) executing innovative investment strategies that maximize value and efficiency. The focus of this working paper is on the last two processes: enhancing institutional capacity and investing in performance, innovation, and long-term success.

Expanding and Strengthening Institutional Capacity

Increasing institutional capacity to support and guide investment decisions associated with the Trust Fund is perhaps the most important action that the state could take at this time. Though increases in new revenue sources like the Trust Fund are necessary, without a change in how revenue is managed, invested, coordinated, and distributed, public trust in the restoration process will suffer, and potential investment efficiencies will be lost. Though the state agencies most directly involved with the restoration effort are efficient and committed to success, the state should shift from a decentralized, program-specific approach, to a more centralized performance-based financing approach.

Institutional capacity is a critical need at all levels of government, especially when coordinating large-scale financing efforts like those associated with restoring the Bay. The purpose of financing institutions is to allocate resources and transfer value through structural financial transactions and markets. In effect, it is the responsibility of financing institutions to implement the financing process of acquiring, investing, and managing fiscal resources. This process is clearly defined in many areas, such as financing capital infrastructure needs related to wastewater management. Institutional gaps and requirements are more complicated in other areas, such as financing the implementation of best management practices related to unregulated nonpoint-source pollution sources.

In most respects, the state has sufficient institutional capacity to finance nonpoint-source restoration activities. However, though existing state restoration programs are for the most part well-run and effective, key institutional breakdowns in the state occur in two areas. First, state agencies often have limited capacity to prioritize and efficiently invest fiscal resources. Investment decisions are often made in an effort to support program priorities rather than to support the most efficient and innovative restoration practices and processes. The second institutional breakdown is associated with interagency communication and coordination of restoration efforts and programs. To overcome these barriers, we recommend the following:

- First, the state should shift from a decentralized, program-specific approach, to a more centralized performance-based financing approach.
- Second, investment decisions should be made on an annual basis, using investment criteria developed by the administration's BAYSTAT program.

By bringing together two innovative state programs—the Trust Fund and BAYSTAT—state leaders have an opportunity to achieve greater efficiencies through increased financing capacity, better coordination among programs, and the flexibility to make investments based on the most up-to-date information, data, and understanding of the performance of best management practices.

A centralized financing approach will increase capacity. Ultimately, implementing and financing the Tributary Strategies will require generating significantly more than \$50 million per year. The magnitude of an effort of this type will require the ability to leverage multiple revenue sources, and this in turn will require appropriate institutional capacity. A centralized financing

approach would provide the state with the ability to acquire, leverage, manage, and invest fiscal resources on a significant scale, thereby enabling the state to support both capital infrastructure and annual subsidy programs as necessary.

Sufficient scale is critically important. For example, the state's wastewater program is predicated on the ability to leverage annual revenue to support capital infrastructure. The same leveraging function will be required for many of the unmet Tributary Strategies, and this will require financing capacity and adequate scale. This type of scale also provides opportunities for financing and supporting new and innovative best management practices and programs. For example, a recent study by the Federal Environmental Finance Advisory Board outlined an innovative approach for financing reductions in diesel emissions from trucks and heavy equipment. A central authority could use scale to provide economic incentives to truck owners to install technologies that would reduce air pollution, as well as air deposition to the Chesapeake Bay.

A centralized financing approach would also provide the state with the capacity to take advantage of interstate financing opportunities in the future. There has been a significant amount of discussion and research over the past several years investigating the need for a regional approach to financing the restoration effort. Though it is our opinion at this time that the Bay jurisdictions should continue to focus on improving the capacity of intrastate financing efforts, in the long-term it is certainly possible that an interstate financing collaboration will be necessary. Having a central financing authority in existence would enable the state to take a leadership role in these regional efforts. In the short-term, there are a variety of innovative investment opportunities that could be leveraged on a regional basis, for example expanding monitoring and performance evaluation capacity. Again, a centralized financing approach would provide the state with the capacity to take advantage of these regional opportunities.

Centralized financing would ensure better coordination of investments. Efficiency can only be accomplished with coordination, and this will be achieved by having a single entity manage and finance the Bay restoration effort. Though there are a variety of governance and corporate structures that could be developed to guide the investment process of the Trust Fund, it is reasonable to assume that the Secretaries of the critical state agencies would serve on the Trust's managing board. As a result, coordination among various state agencies and associated programs would be assured. The Trust Fund should not attempt to implement any project that was in the purview of one of the agencies – each agency would continue to manage its own Bay programs, and it should continue to receive revenue to address necessary administrative costs associated with key programs. The only shift to occur would be to have the funds now come through the Trust Fund and its decision-making apparatus.

One of the strengths of the restoration effort is the fact that many of the state's key agencies are involved in implementing critical programs. As a result of this cross-agency approach, the state is able to leverage core competencies from different programs. Efficiencies are lost, however, when programs are duplicative and when funding is targeted to certain pre-selected programs rather than to those showing the best results and performance. The purpose of the Trust Fund would be to coordinate the investment of state revenues targeting Tributary Strategy implementation. By so doing, the state could prioritize resources and move them across agencies and programs as necessary.

Centralized financing would ensure flexibility. A centralized financing approach, administered by the Trust Fund, would ensure investment flexibility. Because all of the funds would be in one large account instead of many fragmented accounts, the Secretaries, as members of the managing board, would be able to move them into the highest priority areas at will. In addition, the Trust Fund would be able to create new programs – not currently within the

purview of any existing agency – and to lend money to both public and private sector borrowers wherever appropriate.

In some ways, the Trust Fund must also have the flexibility to balance investments between short-term nutrient restoration priorities, and long-term ecosystem protection. This means that in many ways, the state's investment strategies should mirror the ecosystem itself. There are many best management practices that have very clear and direct nutrient reduction benefits. Clearly, the state should focus on these as soon as possible. However, the Trust Fund must also have the flexibility to invest in programs that may not have the same immediate nutrient-reducing impact. For example, investing in certain air deposition mitigation strategies may not have the same \$/pound of nutrient reducing efficiency as other tributary strategy-based practices, but are important for the long-term health of the Bay. In addition, they can reduce air pollution, improve human health, cut energy costs, and help mitigate climate change. As a result, the value of the investment may be much higher than originally assumed. The Trust Fund must have the flexibility to invest in these types of cross-issue opportunities. In the long-term, these types of investments can greatly reduce costs to the community, thereby increasing the community's return on investment.

In effect, this is a multi-ecosystem services approach to investment. Many best management practices often have multiple benefits to society, yet the institutional capacity does not exist to take advantage of the total value that these services provide. For example, many low impact development and urban green infrastructure approaches to stormwater management also benefit communities by improving air quality, increasing property values, reducing urban heat island effects, improving or restoring urban habitats, and increasing recreational opportunities. However, enterprise programs and environmental agencies managing stormwater programs are not able to make investment decisions based on these values and benefits. When the sole function of an agency or utility is to comply with permit obligations, other community values are usually not factored into investment and program implementation decisions. By centralizing its investment decisions, the state could implement flexible programs that are able to mitigate many of these institutional failures. In short, a centralized Trust Fund could invest in projects that have very high return to the entire community over the long-term.

A centralized funding approach would better support and foster innovation. The Trust Fund should have a venture capital investment function. Perhaps the only thing we know for certain about the restoration effort is that we do not know everything that there is to know. In many ways, the Tributary Strategies are a guide to implementation and should not be considered prescriptive. Innovation in best management practices, implementation strategies, financing, and technology will almost certainly advance in the future, but only if there is targeted investment in the right areas. The Trust Fund should have the capacity and authority to invest certain amounts of revenue in innovative new approaches to restoring the Bay. This type of investment approach could ultimately prove to be the most effective program implemented at the state level.

A centralized funding approach would also foster innovative investment in subsidy programs. One of the weaknesses of most government-supported subsidy programs is that they focus almost myopically on specific best management practices. Though there are some exceptions, in reality most government subsidy programs fund specific best management practices. As a result, there is very little incentive to improve program or best management efficiency. By centralizing its restoration funding, the state would have the opportunity to implement subsidy programs that support innovation and efficiency rather than the direct (but limited) application of specific best management practices. One such approach is reverse auctioning, where sellers compete for limited fiscal resources. Funds go to those programs and best management practices that show the greatest efficiency, regardless of technology (though the best

management practice used must have legitimate pollution-reducing benefits). This type of approach has proven successful in Pennsylvania and would offer a very effective approach for a centralized financing institution like the Trust Fund.⁵

The role of BAYSTAT. The Trust Fund's success depends on state leaders having the right information and guidance to make investment decisions. The O'Malley Administration has championed the creation of a BAYSTAT program to bring accountability and responsiveness to the state's work in improving the health of the Bay.⁶ We, too, feel that this type of tool can help bring accountability and efficiency to the investment process, and can serve as an appropriate metric for guiding and informing investments and fiscal decision-making.

There has been considerable discussion concerning the structure of BAYSTAT, and how it will guide implementation decisions and gauge progress in restoring the Chesapeake Bay. A recent policy note issued by the Administration describes the state's vision for the BAYSTAT program:

“BAYSTAT will monitor, measure, and regularly provide a public accounting of the totality of the State's efforts on behalf of the Bay. This information will help guide the State in developing more effective and targeted strategies to measurably improve the health of the Bay.”⁷

BAYSTAT should serve as a guide for making appropriate restoration investment decisions, with a focus on the Trust Fund. With the information gleaned from BAYSTAT's analytical functions, the Trust Fund will develop investment strategies that are guided by program efficiency, performance, and the long-term success of the restoration effort.

At present, the state's primary concern is to reduce nutrients and sediment to the Bay. It is appropriate to imagine a time in the future when watershed priorities may shift due to the success of the restoration effort. For example, investing in programs that protect both water quality and air quality may become a priority in the future, as we struggle to meet multiple environmental priorities. Or, protecting drinking water quality as well as surface water quality may become a priority of the watershed effort. The Trust Fund, and the BAYSTAT tool, would provide the state with the flexibility to prioritize these types of investment options.

Essentially, if developed correctly, BAYSTAT has the potential to serve as the investment component of an adaptive management process for implementing the restoration effort. Adaptive management encourages a “learning by doing” approach to the implementation of natural resource policies and strategies. While conventional management approaches focus on achieving a specified goal by using a fixed set of implementation tools, adaptive management acknowledges upfront the limits of our ability to fully predict the response of ecosystems to management decisions and therefore applies a more integrative process to natural resource management. In adaptive management, decisions are made and modified based on what is known and learned about a system, including the effects of previous management decisions from one program or project to another. The key components include a management policy that specifies actions as a function of the existing information, a monitoring plan to gauge system responses, and an implementation mechanism.⁸ This type of management approach provides a very effective model for directing financing and funding decisions. Rather than focusing exclusively on specific best management practices and programs, state leaders should continually analyze the effectiveness and efficiency of restoration programs and adjust resource allocation decisions based on the most up to date information. This type of approach can only be achieved within a flexible institutional framework, and we feel that the BAYSTAT program provides this flexibility and would allow the state to maximize the return on the public's investment in the restoration effort.

Investing in Innovation

Committing fiscal resources to support research and development is an example of “incentivising” the system. The goal is to create economic and fiscal incentives to encourage the development of new technologies and implementation processes. Such innovation would be the next step in developing a restoration economy.

The Tributary Strategies provide the roadmap for restoring the Bay. However, the strategies themselves are at best a guide for implementation, and are based on the best information, technologies, and practices available at any given time. For example, it is a widely held belief that the strategy to upgrade all of the state's 420,000 (or more) onsite wastewater systems – as is stipulated in Maryland's Tributary Strategies – would be extremely inefficient and potentially ineffective, at an estimated cost of \$3 billion. It would be better to account for these nutrient loads by developing new best management practices and nutrient reduction strategies. As discussed earlier in this report, it will likely prove inefficient to approach the Tributary Strategies and the investment process as prescriptive. Efficiency and cost effectiveness require flexibility and innovation. Developing new technologies, industries, and implementation processes will be critical for the restoration effort, and the Bay states can play a leading role in advancing innovation.

Recent studies have shown that our understanding of the performance of many nonpoint-source best management practices is continually evolving. Many practices that serve as the foundation for the restoration effort across the region do not perform as well as previously thought. Though this discovery should have surprised no one, the public and media reaction to this process of research and development was extremely negative. That perception must be changed. From an investment perspective, new information and knowledge allow for the better management of the risks associated with investment, even if the understanding of the probable return is lowered. In short, better information and knowledge are always good. What these studies do confirm is that we must strive to identify more effective and efficient strategies and best management practices. The state has a unique and critical obligation to support the advancement of knowledge and innovation in this area.

Our recommendation is for the state, through the Trust Fund, to lead regional investment efforts in two key areas: 1) research and development; and 2) supporting innovations in industry and technology related to Bay restoration and protection.

The value of investing in research and development. The phrase research and development (R&D) according to the Organization of Economic Cooperation and Development, refers to "creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications."⁹ R&D investment generally reflects a government's or organization's willingness to improve future performance or returns. This is exactly the type of approach that is necessary for advancing the restoration effort. Clearly we know as much or more about what is impacting the health of the Chesapeake Bay and the measures needed to restore and protect it than any other estuary in the world. But it is both inefficient and presumptuous to assume that all of the best management practices agreed to in the Tributary Strategies are completely understood, efficient, or most appropriate for restoring the Bay. Our understanding and knowledge of the Bay ecosystem itself continues to evolve, as does the value of specific best management practices for ensuring its protection. Therefore, the state should take a leading role in financing the advancement of knowledge, specifically *applied* knowledge, in the areas that most impact restoration programs, processes, and policies. The state should establish investment strategies to codify the research and development industry focusing on Bay restoration issues.

Our intent with this recommendation is not to imply that the research establishment within the state and the watershed needs to be restructured or modified. On the contrary, the Bay states have the advantage of having access to significant academic, public, and private research institutions across the region. It is our recommendation that Maryland leaders leverage this capacity by establishing targeted R&D programs, specifically through support by the Trust Fund, that will enhance adaptive management.

There are a number of approaches for advancing Chesapeake Bay R&D programs. A particularly promising approach is public/private partnerships between corporations and public research universities and institutions. There is a long history of corporate America supporting research and development at universities and academic institutions. A primary impetus for supporting research is to profit from new product development. Industry funding for university research and development in science and engineering fields reached an all-time high of \$2.3 billion in the 2005 fiscal year. Support rose by 7.7 percent, according to data from the National Science Foundation Survey of Research and Development Expenditures at Universities and Colleges.¹⁰ These types of relationships and programs have multiple benefits. First, they advance the technology transfer missions of most major research institutions with the added benefit of supporting state academic institutions, in this case, those in the Chesapeake Bay watershed. Second, they lead to innovation in key industries. And finally, they have the potential to create economic development in high-tech industry sectors. Such efforts could grow new economic activity while saving environmental problems.

Certainly academic institutions throughout the region are all working to establish and expand their own research capacity. Recommending increased support for these efforts is nothing new, and a number of programs, including the Targeted Watershed Grants program and the Sea Grant program, have funded investigations into applied technologies. These are worthy efforts. There has been, however, very little sustained investment or effort to pursue applied R&D on a regional scale. The Trust Fund, perhaps working in concert with other efforts, has the opportunity to formalize a sustained effort to advance the development of technologies, information, research, and practices that will be critical for achieving restoration goals. If the Bay states were willing to make significant investments into R&D activities, and to actively pursue opportunities to leverage state resources with corporate resources, there would be significant opportunities to generate real innovation and change.

Social venture capital. Increasing our knowledge of the Bay ecosystem and its stressors is just one part of the process for ensuring its protection. Ultimately, success will require putting knowledge into action. Throughout this report, we have stressed innovation as being key to establishing a sustainable restoration and protection strategy. Innovation refers to the introduction of new ideas and services into the marketplace with the goal of improving the community. In short, innovation is the process for putting knowledge into action, and one of the most effective ways to spark innovation is to support cutting-edge businesses, industries, and nascent technologies that will accelerate change in the community. Therefore, we recommend that Maryland lead regional efforts to establish a venture capital investment program that focuses specifically on making innovation a real force for change.

Traditional venture capital funds are run by managers who seek much higher rates of return on investments, often accepting extremely high amounts of risk, uncertainty and ambiguity. Venture capitalists earn high returns by understanding and managing risk as they guide a venture through a series of projects involved in the formation of a profitable firm. This is exactly the kind of approach that is needed in the restoration effort. There are a variety of public and private funding programs that focus on water quality and the implementation of new or promising best management practices. But these programs are often very limited in scope and do not have the capacity to manage significant levels of risk. The states have an opportunity, as

the primary financing entities associated with the restoration effort, to create a social venture capital program that fosters and incubates new businesses, industries, and technologies associated with improving and sustaining water quality and ecosystem stewardship. This is basically a social or environmental venture capital approach.

Like traditional venture capitalists, social venture capitalists are similarly well-acquainted with risk and project management activities, although social venture capitalists will restrict their field of interest to those ventures whose rate of return is measured in terms of those metrics which best reflect the magnitude of socially positive results. Social venture capital programs have addressed a wide range of social issues, ranging from social enterprise financing, community and economic development, brownfield development, and healthcare financing.¹¹

Our recommendation that the Trust Fund specifically support innovative research and technology development is based on the need for fiscal efficiency and effectiveness. Everyone's goal should be to restore and protect the Bay in the most efficient way possible, and many examples in business and industry confirm that investing in research and development improves efficiency and maximizes return on investment. What is missing throughout the Bay watershed is a sustained, significant strategy for investing in R&D that specifically advances innovation. If the Bay states were to approach the restoration effort as a business proposition, then R&D and new venture creation would be considered critical to the long-term success and competitiveness of the enterprise. R&D investments usually range from about 5-10 percent of total corporate revenue, with some high-tech industries approaching the 15-20 percent range. Using these percentages, Maryland should commit itself to investing approximately \$5 - 10 million into research and development activities that specifically target the restoration effort. And, if the other Bay states, as well as key industries across the watershed were to follow suit, then a very significant program could be established to harness the creative energy necessary for advancing new ideas and technologies.

Finally, this type of approach would also benefit the community and the region in other ways. One of the most frustrating aspects of the debate centered on the restoration effort is the perceived conflict between ecosystem restoration and economic development. In fact, ecosystems themselves provide significant economic value to the community. In addition, developing the industries and technologies that will serve as the foundation for the Bay restoration effort will also generate economic development. By investing Trust Fund resources in new technologies and industries, Maryland will be fostering a new restoration economy, where communities grow economically in a sustainable way. This is already happening in areas such as green building, low impact development, organic farming, and certain aspects of wastewater management. Investing in the development of innovative environmental industries, with the specific goal of restoring and protecting the Bay, would ultimately provide multiple values to the community, significantly maximizing the state's return on investment.

Conclusion

The creation of the Chesapeake Bay Restoration Trust Fund is a significant step forward in the state's efforts to restore and protect the Bay. We encourage state leaders to take advantage of the opportunity that now exists to fundamentally improve how restoration activities, best management practices, and programs are supported and funded. Simply dividing limited resources among existing government programs does not constitute a wise finance plan and will not prove effective for restoring the Bay. By implementing a three-pronged financing strategy of investing in performance, ensuring institutional and fiscal flexibility, and supporting innovative

technologies and best management practices, state leaders will ensure that the Trust Fund will be an investment in the future and the long-term health of the Chesapeake Bay.

References and Notes

¹ Please note that the governors in each of the Bay states have acknowledged that the states will not meet the 2010 restoration deadline. However, financing and implementation estimates are based on the 2010 timeframe.

² Maryland Department of Natural Resources, Maryland's Tributary Strategy: 2004 Tributary Strategy Executive Summary (Annapolis: Maryland Department of Natural Resources, 2004) 7.

³ All costs in millions.

⁴ This number excludes the total nitrogen and phosphorous loads associated with resource lands.

⁵ For more information on reverse auctioning, see http://www.wri.org/business/pubs_description.cfm?pid=4205

⁶ New Ideas to Improve the Chesapeake Bay: BAYSTAT, 4 Aug. 2007
<omalley.3cdn.net/1857d3b7f96ee13e1f_02m6bhe5j.pdf>.

⁷ New Ideas to Improve the Chesapeake Bay: BAYSTAT, 4 Aug. 2007
<omalley.3cdn.net/1857d3b7f96ee13e1f_02m6bhe5j.pdf>.

⁸ Ana M. Parma, and the NCEAS Working Group on Population Management. 1998. What can adaptive management do for our fish, forests, food, and biodiversity? *Integrative Biology* 1:16-26.

⁹ Wikipedia web site: http://en.wikipedia.org/wiki/Research_and_development. Last accessed August 3, 2007.

¹⁰ Inside Higher Ed world wide web site: <http://www.insidehighered.com/news>. Last accessed on July 2, 2007.

¹¹ Wikipedia website: http://en.wikipedia.org/wiki/Social_Venture_Capital. Last accessed August 20, 2007.