RRI-8 Resource-Based Industries – Economic Initiative

Option Description

Resource-based industries such as forestry, agriculture, commercial and recreational fishing, and sportsmen's activities represent the economic backbone of rural Maryland. These industries are heavily dependent on the health and vitality of the Chesapeake Bay and its tributary ecosystems. Sea level rise (SLR) and associated hazards such as storm surge, coastal flooding and erosion threaten areas where the current primary land use supports these industries. While potential climate change impacts to these industries exist outside the realm of SLR and coastal hazards (changes in salinity, temperature, rainfall, etc.), this option will primarily focus on these particular areas of vulnerability. More comprehensive adaptation response strategies will be prepared during the next phase of adaptation planning.

Baseline information regarding the impacts of climate change and SLR on the economics of varying sectors of resource-based trades and industries is lacking. Research within each respective field should aim to identify these potential impacts, and lead to developing an appropriate strategy to buffer such effects. State agencies, in cooperation with the private sector, should focus efforts on the development of long-range plans (i.e. fishery management plans, forestry management plans, marine sensitive areas initiatives, and agriculture land use plans) that are flexible enough to adjust to ongoing and future change. Such plans should be developed in ways consistent with local land use master plans, and foster small local mills and farms. This option addresses protection mechanisms to minimize the impacts on natural resource industries, or adaptation by the use of new non-conventional methods.

- *Fisheries-based industries:*
  There exists large uncertainty attendant to climate change effects on aquatic habitats and populations. Consequently, the potential impacts to the seafood industry are unknown. Resource populations (i.e., crabs, oysters and finfish) and the industries associated with them are currently under stress due to present land use practices, overfishing, degradation and loss of nursery habitat, and extensive inshore and coastal pollution. Conserving habitat and diversity is a present challenge, and sea level rise may further aggravate wetland and SAV loss. Additionally, not knowing what population and species changes will follow makes it difficult to predict what could replace the current economic engine for which Maryland is famous.

  Concern over species and habitat shifts is real and likely not amenable to mitigation through traditional planning. Long-range plans for these resources will have to be innovative, and should consider all aspects of the seafood industry. This includes, but is

not limited to, areas such as: the methods in which the resource populations and associated habitats are managed; processing, packaging and distribution practices; aquaculture practices; etc. in order to streamline costs and maximize profits while ensuring sustainability. Management efforts should focus on conserving a diversity of habitats to maintain functionality and persistence of populations so they can be resilient during times of stochastic climate conditions and associated coastal hazards.

Significant opportunities might exist within the aquaculture field. Research is needed to determine whether there are populations that should be supplemented, restored in the wild, or generated simply for supply.

- *Forestry-based industries:*

Maryland's forest products industry is a $2.2 billion industry, considered to be the largest in Western Maryland and the second largest on the Eastern Shore. The long-term profitability of the forest products industry is directly linked to a sustainable forest resource base. Sustainable Forestry Management includes the stewardship and use of forests and forest lands in a way that maintains their potential to fulfill relevant ecological, economic, and social functions to ensure the future health and usefulness of the forest. Forests, like other open space areas, are under intense development-related pressures for residential, commercial, and industrial conversion attendant to the demands of a growing population. Identifying areas where the forest products industry is likely to be viable in the long-term provides focus for effective management activities, but should also be adaptive so that if future conditions change and the forest shows signs of stress or decline, silvicultural management techniques can be adjusted. Additional programs and policies – through financial, cost share programs akin programs available for agriculture -- should be developed to streamline and modernize the processing, manufacturing, and distribution aspects of this important resource-based industry.

Potential industry directives may include: supplemental planting on poorly stocked lands; age extension of managed stands; thinning and density management; fertilization and wood waste recycling; expanded use of short-rotation woody crops, for fiber and energy; expanded use of genetically preferred species, and salt tolerant species within projected SLR impacted areas; modified biomass removal practices; fire management and risk reduction; an initiative that directs the use of local wood for construction, furniture or other value-added wood products to enhance local economies while reducing carbon emissions by lowering transportation distances and sequestering carbon in those products; and forest stewardship plans – on both public and private forest lands – that, among other things, address re-developing forested riparian buffers with salt tolerant species.

If managed effectively, forests are a renewable resource and capable of helping Maryland to meet its renewable energy goals consistent with the Renewable Energy Portfolio Standard Act of 2004, the Healthy Air Act of 2006, and the MD Clean Energy Incentive Act of 2006. Major companies and research organizations are also realizing the potential that exists with forest and farm products in the form of biofuels, such as biomass and cellulosic ethanol. Shell Oil has predicted "the global market for biofuels such as cellulosic ethanol will grow to exceed $10 billion by 2012." Reducing the cost and improving the

efficiency of separating and converting cellulosic materials into fermentable sugars is one of the keys to a viable industry for Maryland.

Hundreds of thousands of tons of wood "waste" (dead trees, tree branches, yard clippings, left-over crops, and forest by-products - wood chips, bark and sawdust) are generated annually in MD, which could be used to create heat and/or power and become an ideal substitute for heavy carbon-emitting fossil fuels such as oil and gas. Wood energy technology is available and widely used in schools, hospitals, and other institutions throughout the northeast and Midwest, with the attendant environmental benefits and cost savings well documented. As part of the forestry management plan, the State should provide funding to underwrite the conversion of boiler systems in Maryland's public institutions to utilize the ample wood wastes available locally.

- *Agricultural industries:*

Sea level rise could disrupt agriculture and livestock operations in low elevation areas that are subject to flooding and inundation. Further establishment of operations within these areas should be minimized, and where feasible relocated or protected to minimize impacts. Considerations should be made to protect or move ground water wells and waste storage structures associated with existing operations in vulnerable areas. The use of new non-conventional agriculture crops which are salt tolerant should be considered, and could replace traditional industries. Additionally, nurseries that specialize in native wetland plants could experience increased demand as a result of another recommendation put forth by this group, "Sustainable Shorelines and Buffer Management Practices", which calls for the use of nonstructural erosion control projects or "living shorelines". As such, business development for these potential new industries needs to be addressed.

A potential industry exists within processing the by-products of farm practices for renewable energy, as mentioned under the forestry-based industries discussion. Previously thought to be unsuitable for further use, chicken litter, methane, slash, switchgrass, corn stalks, and other agricultural by-products and feedstocks are now being considered important sources of renewable energy. This policy option would increase the utilization of biomass from rural feedstocks, including processing by-products for generation of electricity, thermal energy, and transportation fuels. All potential uses and sources will be considered, and sustainability of supply should be determined and gauged via various implementation strategies.

This option also recommends expanding and developing programs at the state and local level that promote the sustainable production and consumption of locally produced agricultural goods, which displace the consumption of those transported from other states or countries. This "buy-local" initiative will address, as appropriate, increasing local farmer's markets and food co-ops and/or buying clubs, in order to make locally produced goods more readily available for consumers.

- *Tourism industry:*

- *Marine trade and port activities:*

The recreational marine trades industry in Maryland contributes $2.3 billion per year to the economy, employs more than 28,000, and serves some 220,000 boats registered in Maryland plus boats visiting from other states. This industry is comprised of boatyards, marinas, and commercial marine service facilities, including docking, service, and market facilities for the catch. Many of the recreational and commercial facilities are located on the waterfront within a few feet of the current sea level. These water dependent businesses are vulnerable to the impact of sea level rise (SLR). Depending on the elevation of adjacent upland land, some will ultimately need to relocate; others will be able to defend against SLR by raising the elevation of their properties.

Port activities account for a significant portion of Maryland's economy and employment, with a combined 128,000 jobs linked to the Port of Baltimore alone. According to the report "*Economic Impacts Generated by the Port of Baltimore in 2005* (August 22, 2006)", the Port of Baltimore was responsible for $2.4 billion in personal wage and salary income in 2005; generated $1.9 billion in business revenues in 2005; local purchases by businesses directly dependent on port activity amounted to $1.1 billion; activities of the Port generated state, county and municipal taxes of $278 million; and the U.S. Customs Service collected $507 million in 2005. These facilities are also vulnerable to the impact of SLR and will need to be addressed through strategic planning efforts.

- *Coastal management and restoration industries:*

Managing shoreline erosion, either through living shorelines, or other stabilization methods, will continue to grow as an emerging industry in Maryland's coastal counties. In addition, other industries related to coastal ecosystem and infrastructure management, whether it be wetland or forest restoration, retrofitting of coastal infrastructure or water management, will continue to grow and prosper. Many new economic opportunities will develop. Efforts should be focused to support these emerging industries and developing guidance on standardized practices and fostering innovations represents opportunities in restoration and coastal management economies that should be harnessed. (cross cutting with shoreline management, green economy?)

Option Design

Targets:

- Research on the potential economic impacts from SLR and coastal hazards should be conducted within each respective field. Part of this effort should include a mechanism to monitor or track economic changes within each sector (**See option FBEI-6**).
- Develop an overarching planning guide for each of the industries using a systematic and strategic approach.
- Leading Economic Indicators – (I thought that one of the TWG members was encouraging this, but I'm not sure I grasped and wrote down enough of the conversation to understand what should be done).

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Fisheries-based Industries

1. Protect, conserve, and restore natural shorelines and marshes in a systematic way to support the extent and diversity of habitats needed to sustain the base of these industries. Part of this target will require the use of "living shorelines", where appropriate, as a means to address shoreline erosion while maintaining a continuum of habitat and natural resource features that extend from shallow water habitats, beaches and wetlands to upland forested buffers. Oyster, SAV and tidal wetland restoration targets should be modified to account for SLR projections and other climatic changes to ensure long-lived project success.
2. Develop and promote alternative trade businesses which can supplement and/or replace traditional seafood harvesting as a natural resource based industry.
3. Aquaculture practices should be identified in order to effectively buffer natural resources, which may also involve expanding and siting new facilities to carry out these practices.

Forestry-based Industries

Adapt forestry practices to address impacts of sea-level rise and continue to foster the support and strengthening of traditional and innovative forestry supply and demand market forces to ensure that forests remain in place and expand to provide adaptation, and green house gas mitigation benefits.

1. Promote the adoption of Forest Stewardship Plans on public and private forestlands, especially within those areas of the State most threatened by rising sea levels. Use offset funds to enhance forest management on private lands and reduce conversion to other land uses.
2. Identify or develop cultivars of salt-tolerant tree species that can produce fiber suitable for the forest products industry and increase the supply of nursery stock in State run nurseries.
3. Mitigate regulatory burdens that help facilitate sustainable management of forest lands, especially in areas impacted by rising sea levels.
4. Develop guidance and training programs for professional consultant foresters to assist the integration of climate change adaptation recommendations with forest management plans.
5. Identify opportunities within existing programs or develop new financial assistance programs that can be used to assist landowners with the additional expenses incurred to manage and replace trees suffering from sea-level rise related stressors and to adapt forestry management practices to changing climatic conditions. This would require a shift in decision making efforts to plan ahead for changing conditions (invasive species, damaging insects and diseases, etc.), and move towards prevention or proactive management rather than control and reactive treatment.

Agricultural Industries

1. Develop new non-conventional crops for use in low elevation agricultural area, which will be subject to flooding or wet conditions in the future. This includes use or the development of salt tolerant crops, as increased saltwater impacts are generally associated with lands adjacent to the sea level rise areas.
2. Develop and assist in the funding for any ground water well protection associated with agricultural production. In addition, account for well head protection for those systems important for providing clean drinking water.

3. Identify poultry and other livestock operations located in high risk areas and develop temporary protection methods to minimize flooding impacts. Work with local Planning and Zoning Offices to prevent future establishment of these operations in high-risk areas. These efforts will include the waste storage structures associated with these operations.
4. Decrease the conversion of agriculture land to developed land through the protection of 1.2 million acres of productive agricultural lands, to ensure no net loss by 2020.
5. Develop a program in order to promote and expand local farmer's markets and food co-ops, and provide outreach to local communities.

Marine Trade and Port Activities

1. Facilities that support these sectors should be assessed for infrastructure vulnerability to SLR and coastal hazards. Develop a framework for making abandon/modify/move/protect decisions to address long-term strategic planning and potential solutions for these at risk facilities. This target could overlap and/or be supplemental to option EBEI-3 – Adaptation of Vulnerable Private and Public Sector Infrastructure.

- **Timing:**

An intensive public relations effort, as well as necessary background research, will begin prior to full implementation (2008-2009). The public relations effort should be directed at the citizens of Maryland particularly located in future SLR impacted areas, but span across the various resource-based sectors. This program should run indefinitely (continuous) and be evaluated every 5 years for effectiveness.

Startup of the various programs are to be implemented in 2009, and ramp up to higher levels in 2015 and 2020. Forestry – programs will be implemented in 2009 due to the need to establish forest areas as soon as possible. This will maximize the benefits of growth prior to future needs.

By 2020: a long term goal should be sustainable forestry management plans for 100% of State-owned forested lands; local farmer's markets in Maryland increased by 25%; the amount of locally grown and processed lumber to displace imported wood by 20%

By 2050: local farmer's markets in Maryland increased by 50% to support a target of 80% of the food Marylanders consume to be grown or produced locally; and amount of locally grown and processed lumber to displace imported wood 50%.

- **Parties Involved:**

DNR, MDA, MDE, numerous fisheries, forestry and agricultural organizations and business interests.

- **Other:**

Counties, SHA, Chesapeake Bay Program, NRCS, USFS, private land owners, public land owners, private sawmills, landscaping industry, nursery industry, MD Cooperative Extension and Master Gardeners. Agricultural and wood product primary producers such as Maryland farmers, lumber mills, farmer's market associations and promoters; value-added producers such as

Maryland caterers, producers of packaged food for retail, furniture makers, construction businesses, wholesalers and retailers of construction and do-it-yourself products, architects and designers; applicable trade associations, MDA, DNR, LEED certification entities.

Implementation Mechanisms

There are many existing programs (agricultural assistance, economic development grants, etc.) and policies in place that will support the implementation of this option. Overall implementation could resemble the framework for the Green Infrastructure, including such elements as land acquisition, conservation easements, purchase and transfer of development rights, tax credits and structures, and zoning. The toolbox would also include refining land use planning policies and funding programs to allow users of these tools – governments, non-governmental organizations and private citizens. Additional opportunities include the utilization of new Farm Bill program funding to promote alternative crops. State and local regulations may be needed through existing zoning programs to prohibit new poultry and livestock operations in at risk areas. The Md. Dept of the Environment may need to investigate if existing regulations are in effect for the installation of well protection devices to prevent salt water contamination of ground water sources.

Specific incentives recommended:
• Provide credit through LEED for wood products sustainably grown and harvested locally
• Increase incentives through programs such as Fuels for Schools, tax-forgiveness
• Establish incentives for utilizing renewable heating fuels (such as tax credits similar to those afforded electric producers in the MD Clean Energy Act)
• Support all activities through an extensive outreach and education effort

**It should be noted this recommendation has multiple areas of crosscutting implementation mechanisms for a recommendation being proposed by the Future Built Environment and Infrastructure group – Economic Development

Related Policies/Programs in Place

Fisheries Programs

The Task Force on Fisheries Management, created by Chapter 217 of the Acts of 2007, is charged with overseeing a full review of current fishery management processes and developing recommendations for methods to improve, modernize, and streamline fishery management. The Task Force will look in depth at a range of fisheries conservation challenges, management issues, and a variety of science concerns, including stock assessment capabilities and limitations, ecosystem based interactions, and socioeconomic considerations associated with Maryland's fisheries.

Farming and Forestry Assistance Programs

The Maryland Departments of Natural Resources and Agricultural, the U.S. Department of Agriculture, academic resources, such as those available through the University of Maryland system, and local forestry and farming boards offer a wide range of technical, financial and research assistance and training programs to members of the State's rural resource based industries. Adaptation guidance and assistance can be developed and delivered through these

existing programs, so long as financial resources are made available to them to effect responsive outreach efforts.

Feasibility Issues

Staffing and funding must accompany any programs as current on-the-ground and support resources are minimal at this time due to funding cuts and staff reductions at the state level.

Status of Group Approval

Barriers to Consensus