

Appendix A

Chesapeake Bay Program

FY05 Activity Information

Outcome Title and Number:	Addressing the Limitations of the '99 Toxics Loading and Release Inventory (TLRI) Stormwater Monitoring TSC05-1
Cost Estimate Range:	\$90,000 - \$125,000
Project Duration:	Multi-year: two years. A multi-year proposal should have a workplan and budget for 2005 and an estimated budget and outcomes for future years.
Supported C2K Commitment(s):	Toxics 2000 page 9- Conducting Monitoring, Assessments, and Research “By 2007, refine the 1999 TLRI including chemical contaminant loads from upstream sources, agricultural runoff, urban/suburban runoff, atmospheric deposition, point sources and groundwater.” Data gaps identified in the “Chesapeake Bay Basin Toxics Loading and Release Inventory” May, 1999, “What are the Limitations of the 1999 Inventory?” page i-9, “The contribution of specific upstream sources to tidal loads are unknown.”
Additional Evaluation Criteria:	None.
Expected Outcomes:	<ol style="list-style-type: none"> 1. Based on existing NPDES stormwater data metals loadings from developed lands will be estimated for incorporation in the TLRI. 2. Based on new monitoring using methods consistent with NPDES collection methods and using the lowest achievable detection methods, organics loads will be estimated using newly collected data from field measurements.
Expected Methodology:	<p>Phase 1: Synthesis of existing NPDES stormwater data and statistical analysis to estimate loads based on land-use and watershed size.</p> <p>Phase 2: New monitoring for organics in stormwater, which is not available in existing NPDES stormwater data. Consult EPA monitoring guidance and local practice for NPDES stormwater monitoring. Low-level detection levels will be necessary (congener specific PCBs). Analyses will include PCBs, Organochlorine pesticides, PAHs, and PBDEs.</p> <p>If a project is selected, the applicant must prepare a Quality Assurance and Project Plan (QAPP) and a Quality Management Plan (QMP).</p>
Deliverables:	<p>Deliverables include:</p> <p>Phase 1: Includes report on metals, monitoring design, and QAPP for Phase 2, which will include the sampling design.</p> <p>Phase 2: A report that will include the organics component of stormwater loads.</p>
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Outcome Title and Number:	Environmentally-Sensitive Development Practices – Demonstration Projects LGSS05-1
Cost Estimate Range:	FY 05-\$240,000 FY 06-TBD FY 07-TBD
Project Duration:	Multi-year: three years. A multi-year proposal should have a workplan and budget for 2005 and an estimated budget and outcomes for future years.
Additional Evaluation Criteria:	None.
Supported C2K Commitment(s):	The 26 commitments in C2K Section 4.0 – “Sound Land Use” page 8. In working with communities and local government to develop and effectively implement “Sound Land Use” policies and programs. By 2012, reduce the rate of harmful sprawl development of forest and agricultural land in Chesapeake watershed by 30 percent, and encouraging sound land use planning and practices that address the impacts of growth, development, and transportation on the watershed. By 2005, identify and remove state and local impediments to low impact development and minimize water quality impacts. Promote the redevelopment and removal of barriers to address the underutilized urban, suburban, and rural communities. By 2002, compile information and guidelines to promote ecologically-based designs in order to limit impervious cover in undeveloped and moderately developed watersheds and reduce the impact of impervious cover in highly developed watershed. By 2003, develop land-use management and water resource protection approaches that encourage the concentration of new residential development in areas supported by adequate water resources and infrastructure to minimize impacts on water quality. By 2010, strengthen brownfield redevelopment, by rehabilitating and restoring 1,050 brownfield sites to productive use.
Expected Outcomes:	Working with individual local governments, conduct demonstration projects on how to revise zoning, codes and ordinances to incorporate environmentally sensitive approaches to new development and to infill and redevelopment. We expect three to six projects throughout the Chesapeake Bay watershed at this level of funding, with an anticipated 50 percent target match.
Expected Methodology:	This funding either would be provided directly to interested local governments, or to organizations that would provide such service to interested local governments. In either case, the local government must demonstrate strong support for the project prior to funding, and a willingness to participate in technology transfer of the results to neighboring communities specifically and throughout the watershed more generally. This technology transfer may be accomplished, in part, through coordination of activities with the Bay Program Training and Outreach Coordinator.
Form of Deliverables:	A final report detailing the assistance providing a description of the methodology, and results. And presentation of results at a minimum of two training/outreach events.
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Outcome Title and Number	Enhanced Sediment Collection for Improving Continuous Sediment Simulations NSC05-1
Project Duration:	Multi-year: three years. A multi-year proposal should have a workplan and budget for 2005 and an estimated budget and outcomes for future years.
Cost Estimate Range:	\$70,000/yr
Supported C2K Commitment(s):	<p>By 2010, correct the nutrient and sediment related problems in the Chesapeake Bay and its tidal tributaries sufficiently to remove the Bay and the tidal portions of its tributaries from the list of impaired water under the Clean Water Act.</p> <p>Specifically, the following sections of the C2K agreement pertain: “Nutrients and Sediments” page - 6</p> <p>By 2001, define the water quality conditions necessary to protect aquatic living resources and the assign load reductions for nitrogen and phosphorus to each major tributary; using a parallel process to that established for nutrients, determine the sediment load reduction necessary to protect aquatic living resources.</p> <p>“By 2002, complete a public process to develop and begin implementation of revised tributary Strategies to achieve and maintain the assigned loading goals.”</p> <p>By 2003, with the Susquehanna River Basin Commission and other to adopt and begin implementing strategies that prevent the loss of sediment retention capabilities of the lower Susquehanna River dams.</p>
Additional Evaluation Criteria:	None
What questions or information gaps will the outcome answer:	<p>Will predicting suspended sediment concentration and loads from continuous simulations significantly improve the ability to provide detailed and accurate suspended sediment information than the classical approach that relies on correlations between discharge and sediment?</p> <p>Will this more accurate data provide improved simulations for load model estimation, integration and calibration?</p> <p>Will the continuous simulation result in cost savings over time by reducing the need for suspended sediment samples?</p>
Expected outcomes:	The data will be used to demonstrate how accurate the current models are and how precise predictions from these models can be given various land uses, land use changes, etc. Goals for 2010 can be refined based on state-of-the-art technology and stakeholders, the public, agencies, and others can have confidence in how the goals were selected and evaluated for success.

<p>Expected Methodology:</p>	<p>The project proposes continuous measurement of suspended sediment concentrations. Technological advances in the field of in-situ water-quality sensors and improved telecommunications have finally made this approach feasible. One method for this study is given below, however, a grantee may propose a variation or different methodology along with appropriate justification.</p> <ol style="list-style-type: none"> 1. Install continuously recording devices to simulate sediment co-located with an existing gauge at one or more sites¹. Installation to include telemetry equipment that communicates the sensor data back to a central office location. Through this telemetry, the data can be observed and reviewed in “real time”. 2. Collect manual samples over a large range of flow conditions and analyze for suspended sediment concentrations. 3. Develop site-specific regression equations to relate continuous values and suspended sediment concentrations over a complete range of flow conditions. 4. Use regression equations to predict continuous suspended sediment concentrations from the continuous simulation data . 5. Predict the uncertainty in the suspended-sediment concentrations using the unexplained variance from the regression equations. 6. Predict continuous sediment loadings from the continuous suspended sediment concentrations and the continuous discharge record. 7. Compared the predicted loadings to sediment load estimates from other existing methods (like ESTIMATOR). 8. Documented and evaluate the differences between methods. 9. <p>If a project is selected, the applicant must prepare a Quality Assurance and Project Plan (QAPP) and a Quality Management Plan (QMP).</p> <p>¹. Number of sites should not exceed four. Sites should be located at or near the most downstream non-tidal stations in the larger river basins. i.e. York, Potomac, James, Rappahannock.</p>
<p>Form of Deliverables:</p>	<p>Summary report describing the monitoring areas, methods used to collect data, data collected for each area, and the estimated cost per monitoring effort. Report could also include recommendations specific to refining the models in use and setting realistic sediment goals (interim and optimal, if appropriate) for 2010 and beyond.</p>
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Outcome Title and Number:	Performance Evaluation of Advanced Onsite Wastewater Treatment Options NSC05-2
Project Duration:	Multi-year: two years. A multi-year proposal should have a workplan and budget for 2005 and an estimated budget and outcomes for future years. Installation of the onsite units should be completed within the first year; however, completion of the report and/or process modifications may take 18-20 months to complete.
Cost Estimate Range/yr:	\$50,000-\$60,000/yr
Supported C2K Keystone Commitment(s):	<p>By 2010, correct the nutrient and sediment related problems in the Chesapeake Bay and its tidal tributaries sufficiently to remove the Bay and the tidal portions of its tributaries from the list of impaired water under the Clean Water Act.</p> <p>Sections -</p> <p>Specifically, the following sections of the C2K agreement pertain: “Nutrients & Sediments, Chemical Contaminants, & Development, Redevelopment & Revitalization” pages – 6,7,9.</p> <p>Continue efforts to achieve and maintain 40 percent nutrient reduction goal agreed in 1987, as well as, the goals being adopted in tributaries south of the Potomac River.</p> <p>Complementing state and federal regulatory programs to go beyond traditional point source controls, including nonpoint sources such as groundwater discharge and atmospheric deposition, by using watershed based approach.</p> <p>By 2002, develop analytical tools that will allow local governments and communities to conduct watershed-based assessment of impacts of growth, development, and transportation decisions.</p> <p>“By 2012, reduce the rate of harmful sprawl development of forest and agriculture land in the Chesapeake Bay watershed by 30 percent measured as an average over five years from baseline of 1992-1997, with measures and progress reported regularly to the Chesapeake Executive Council. “</p>
What questions or information gaps will the outcome answer?:	<p>Results will determine the optimal TN performance level of onsite systems, engineered for site specific factors, and to determine the accuracy of modeling assumptions and future costs (contained in the UAA).</p> <p>Better quantification of performance expectations and determine the ability of a specific system/manufacturer to denitrify.</p> <p>The cost-effectiveness of addressing onsite systems and/or denitrifying systems.</p>
Additional Evaluation Criteria:	<p>In addition to the criteria specified on page 7 of the RFP Guidance Document, the following specific criteria will be used to evaluate proposals for this RFP topic:</p> <ol style="list-style-type: none"> 1) Experience/years commensurate with this technology (0-5 points); 2) Performance Data from similar systems in support of the applicant (0-10); 3) Average cost per installation (0-5 points); and 4) Complete and accurate budget (0-5 points).

<p>Expected Outcomes:</p>	<p>Installation of onsite wastewater treatment process(es) capable of meeting a performance standard not to exceed 14.0 mg/l total nitrogen on an annual average; performance shall be demonstrated following the mechanical process but prior to discharging to the land treatment/absorption system.</p> <p>As a result, we will be better able to quantify performance expectations and qualify the ability of the system/manufacturer to denitrify. Additionally, technologies capable of achieving the better/best nitrogen reduction could be promoted throughout the watershed.</p>
<p>Expected Methodology:</p>	<p>The CBP program will provide a list of suitable sites for installation of the advanced onsite treatment systems, which may be anywhere within the watershed.</p> <p>The respondent submitting the proposal shall include a <i>minimum</i> of 4 installations/systems from the list provided by the CBP and average cost per installation shall be one of the criteria used to evaluate proposals. It shall be the responsibility of the grantee to obtain all state/local permits needed for installation.</p> <p>The proposal should delineate costs, at a minimum, according to capital costs, maintenance/operations costs, sample costs, travel costs, subcontracts, and report preparation. The applicant shall be responsible for evaluating and incorporating any design parameters (i.e. flow, alkalinity, waste strength) unique to the specific installation.</p> <p>Compliance with the performance standard (see expected outcomes) shall be demonstrated by collecting a 24-hour composite sample for total nitrogen, following the mechanical treatment process and prior to discharging to the land treatment/absorption system. The sample shall be taken one day/week (varying between Monday and Friday) and for a 12-month duration. An independent laboratory shall complete an analysis of the sample for total nitrogen in accordance with appropriate methods, holding times, and preservations listed in the current 40CFR136. All sample results shall have a chain of custody and a certificate of analysis.</p> <p>If a project is selected, the applicant must prepare a Quality Assurance and Project Plan (QAPP) and a Quality Management Plan (QMP).</p>
<p>Form of Deliverables:</p>	<p>Two summary reports shall be provided – one following six consecutive months of operational data and one following 12 consecutive months of operation. Both reports shall provide a monthly performance summary and graph for each installation, along with a narrative of any operational and/or process changes made. In addition to monthly performance information and narrative, the final report shall include: 1) the overall performance (including removal efficiency) of the installation; 2) any installation-specific conclusions regarding the expected outcome; and 3) to the extent possible, a summary & average of monthly operational costs.</p> <p>Additionally, the applicant shall be responsible for delivering any routine maintenance or system management needed during the first twelve months of consecutive operation for each system. Once the system is operating satisfactorily as per the basis of design requirements, maintenance and management shall become the responsibility of the owner, in accordance with any state/local requirements.</p> <p>Maintenance/management of the system and analysis of the wastewater samples may be subcontracted.</p>

<p>Who will use this information & how:</p>	<p>While not inclusive, onsite treatment and performance may be used by the modeling subcommittee and either urban or point-source work groups evaluating potential BMP's and efficiencies. Information will also be useful to States, health agencies, and local governments in determining the economic impacts (UAA) of the BMP.</p> <p>Cost-effectiveness and treatability information may also be used by the CBC in future "Blue Ribbon" cost presentations.</p> <p>Technologies capable of achieving the better/best nitrogen reduction can be promoted throughout the local and regional watershed. It could also be used to help promote pollution prevention at small businesses, such as restaurants and service stations.</p>
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Outcome Title and Number:	Management of phosphorus species inputs to Chesapeake Bay to maximize water clarity and SAV by reducing phytoplankton growth. NSC05-3
Project Duration:	18 months.
Cost Estimate Range:	\$40,000 - \$55,000/yr
Supported C2K Keystone Commitment(s):	<p>Recommit to the existing goal of protecting and restoring 114,000 acres of submerged aquatic vegetation (SAV).</p> <p>By 2002, revise SAV restoration goals and strategies to reflect historic abundance, measured as acreage and density from the 1930s to the present. The revised goals will include specific levels of water clarity that are to be met in 2010. Strategies to achieve these goals will address water clarity, water quality, and bottom disturbance.</p> <p>By 2002, implement a strategy to accelerate protection and restoration of SAV beds in areas of critical importance to the Bay's living resources.</p> <p>By 2010, correct the nutrient and sediment related problems in the Chesapeake Bay and its tidal tributaries sufficiently to remove the Bay and the tidal portions of its tributaries from the list of impaired water under the Clean Water Act.</p> <p>By 2003, the jurisdictions with tidal waters will use their best efforts to adopt new or revised water quality standards consistent with defined water quality conditions. Once adopted by the jurisdictions, the Environmental Protection Agency will work expeditiously to review the new or revised standards, which will then be used as a basis for removing the Bay and its tidal rivers from the list of impaired waters.</p>
What questions or information gaps will the outcome answer?	<p>What is the relative effectiveness of controlling various forms of phosphorus inputs to improve Bay water quality?</p> <p>What are the most cost-effective strategies to reduce algae response and improve water clarity through phosphorus reduction?</p> <p>Historically, jurisdictional policy makers and program managers have evaluated the various point and nonpoint BMPs for the least-cost means to achieve the greatest reduction in total nutrients delivered to the watershed. This inadvertently could have resulted in the selection of BMPs that could reduce the loss of forms of phosphorus that have little effect on water quality.</p> <p>Development of a differential scaling procedure for various phosphorus species would provide an equitable means to compare costs and water quality benefits of various nutrient reduction techniques. The result should allow jurisdictions to focus on reducing more problematic forms of phosphorus that have greater impact on algae growth and water clarity in non-tidal and tidal tributaries and SAV than does total phosphorus. Water quality improvements are more responsive to reductions in certain forms of phosphorus.</p>

	<p>There are far reaching potential applications of this information in the Chesapeake Bay Program. The level of total nutrient reduction required to meet water quality criteria has a massive cost and may not be politically achievable. By shifting the focus to reducing forms of nutrients that will maximize water quality improvement, jurisdictions will be able to identify the least cost alternative that positively impacts water quality. To meet the 2010 commitment to remove the Bay and its tributaries from the impaired waters list, the basis for a new means of evaluation and decisionmaking needs to begin now.</p>
Additional Evaluation Criteria:	None
Expected Outcomes:	Develop criteria necessary for Chesapeake Bay Program policy makers and program managers to make a decision on potential use of scaling factors for long-run phosphorus bioavailability as a basis for evaluating nutrient reduction effectiveness.
Expected Methodology	<p>The contractor will perform an international literature synthesis of all available information on this topic and review and evaluate all relevant existing CBP data to recommend specific phosphorus long-run bioavailability scaling factors for categories of phosphorus compounds. Potential for bioavailability will be that portion of each category of phosphorus compound expected to be converted to bioavailable forms of phosphorus in the long-run (in 50 years) within the Chesapeake Bay tributaries and main stem. It should consider processes including release of phosphorus in water soluble forms from anaerobic sediments as well as percentage of phosphorus forms not likely to become available due to burial in sediments. Phosphorus compounds should be grouped as dissolved inorganic (ortho/SRP); dissolved organic; labile particulate; several forms of particulate inorganic to include, but not limited to iron phosphates, aluminum phosphates, and calcium phosphates; and particulate organic phosphorus.</p> <p>If a project is selected, the applicant must prepare a Quality Assurance and Project Plan (QAPP) and a Quality Management Plan (QMP).</p>
Form of Deliverables:	<ol style="list-style-type: none"> 1. Literature synthesis and summary report that recommends specific phosphorus long-term bioavailability scaling factors for species of phosphorus compounds. 2. Presentations to the Ag Workgroup and Nutrient Subcommittee. 3. Copies of supporting information on which recommendations are based, including copies of relevant published papers/articles.
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Outcome Title and Topic:	Comparison of Nutrient Load Reduction Efficiencies in Nitrogen-based and Nitrogen-Phosphorus-based Nutrient Management Plans NSC05-4
Project Duration:	Multi-year: three years. A multi-year proposal should have a workplan and budget for 2005 and an estimated budget and outcomes for future years.
Cost Estimate Range:	FY 05-\$90,000 FY 06 and 07-\$70,000
Supported C2K Keystone Commitment(s):	Specifically, the following sections of the C2K agreement pertain: “Nutrients and Sediments” page - 6 “By, 2001, define the water quality conditions necessary to protect aquatic living resources and then assign load reductions for nitrogen and phosphorus to each major tributary.” “By 2010, correct the nutrient – and sediment- related problems in the Chesapeake Bay and its tidal tributaries sufficiently to remove the Bay and the tidal portions of its tributaries from the list of impaired waters under the Clean Water Act.” Using a parallel process established for nutrients determine the necessary sediment load reductions to achieve the water quality conditions that protect aquatic living resources, and assign load reduction for sediment to each major tributary by 2001. “By 2002, complete a public process to develop and begin implementation of revised Tributary Strategies to achieve and maintain the assigned loading goals.”
What questions or information gap the RFP topic will answer?:	The study will provide information on nitrogen and phosphorus reduction efficiencies as a result of the implementation of each type of the nutrient management plans using single and combined sources of organic and inorganic nutrient sources in major cropping systems in the Chesapeake Bay watershed.
Additional Evaluation Criteria:	1. Proposed field evaluation methodology will produce desired results in the specific timeframe. (0-5) 2. Lab analysis technique. (0-5)
Expected Outcomes:	Science based reliable implementation efficiencies that can be used by the Chesapeake Bay Program, Tributary Teams, and jurisdictions to improve the accountability of water quality and pollution control programs. Provides reliable information for policy makers and program executives to justify and promote the effectiveness of phosphorus-based nutrient management plans under specific site conditions.
Expected Methodology:	The specific methodology to meet project objectives should be submitted by investigator(s). It is expected that the project will monitor both surface and groundwater movements from both nitrogen-based and nitrogen-phosphorus based nutrient management plans. The project should include a literature synthesis on available studies on the water quality effectiveness of nutrient management plans using various levels of nitrogen and/or phosphorus inputs. The specific methodologies include flow measurement, sampling and monitoring nutrient runoff from surface water, and leaching to groundwater. The project should be conducted at the field scale.

	<p>Initial soil tests and soil cores within and below the root zone to determine the physical characteristics as well as the nutrient content of the soil prior to the beginning of the project and semi-annually thereafter. The results on water quality and crop yields will be analyzed after each cropping season. The investigators should project potential long-term phosphorus water quality impacts of alternative strategies including: (1) build-up of soil phosphorus with only a nitrogen based constraint compared with (2) phosphorus index, and (3) phosphorus threshold constraints.</p> <p>The project sites should represent 2 to 3 physiographic regions in the Chesapeake Bay watershed such as piedmont and costal plains.</p> <p>All data collection and storage, lab analysis and reporting will meet CBP CIMS requirements.</p> <p>If a project is selected, the applicant must prepare a Quality Assurance and Project Plan (QAPP) and a Quality Management Plan (QMP).</p>
<p>Form of Deliverables:</p>	<ol style="list-style-type: none"> 1. Quarterly progress reports indicating status of the project. 2. Year One-Summary report of literature synthesis, analysis of findings and copies of relevant papers/articles related to conclusions. 2. Year Two-update summary report and presentation to the workgroup/subcommittee on project status and findings to date. 3. Final report, recommendations and supporting data.
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Outcome Title and Number:	Pollutant Removal Efficiency of Street Sweeping and Storm Drain Cleaning Programs NSC05-7
Project Duration:	Multi-year: two years. A multi-year proposal should have a workplan and budget for 2005 and an estimated budget and outcomes for future years.
Cost Estimate Range:	\$50,000 - \$80,000 /yr
Supported C2K Keystone Commitment(s):	By 2010, correct the nutrient and sediment related problems in the Chesapeake Bay and its tidal tributaries sufficiently to remove the Bay and the tidal portions of its tributaries from the list of impaired water under the Clean Water Act.
What questions or information gap the will the outcome answer?:	<p>What are the pollutant removal efficiencies for street sweeping and storm drain cleaning programs in the Chesapeake Bay?</p> <p>How do these pollutant removals relate to reduced nutrient and sediment loading rates to streams and the Chesapeake Bay?</p> <p>What program design aspects relate to improved pollutant removal efficiency? (frequency of cleaning, equipment used, etc.)</p>
Additional Evaluation Criteria:	<p>Will the proposal address the information gaps stated above, accomplish multiple environmental benefits and do so in a cost effective manner. (0-5)</p> <p>Does the project include the ability to relate nutrient before/after loads spatially? (lbs/ac or lbs/L. ft. of road surface swept) (0-5)</p>
Expected Outcomes:	<ol style="list-style-type: none"> 1. Documentation of pollutant removal efficiencies from street sweeping and storm drain cleaning programs in communities both inside and outside the Chesapeake Bay Watershed. 2. Recommendations on how to increase the efficiency of street sweeping and/or storm drain cleaning programs.
Expected Methodology:	<p>Deliverables should be based on an extensive literature search/synthesis, a basin-wide community survey of existing programs, and an intensive monitoring program to establish “before” condition and “after” reduction impact of street sweeping and storm drain cleaning programs on nutrient and sediment loads. The monitoring program must relate pollutant removal as measured by pollutant content in the materials removed by street sweeping and storm drain cleaning to pollutant reduction at the outfall in the cleaned area. The removal efficiency must be partitioned between street sweeping programs and storm drain cleaning programs. Loads should be expressed as concentrations/ton of material. The ability to establish a relationship between the material collected and the associated area swept or serviced by the storm drain should be considered, but not required. (The ability to provide this information is a criteria element.)</p> <p>If a project is selected, the applicant must prepare a Quality Assurance and Project Plan (QAPP) and a Quality Management Plan (QMP).</p>
Form of Deliverables:	The deliverables will be in the form of data, a summary report on removal efficiencies to be used in the Chesapeake Bay watershed model, and recommendations for street sweeping and storm drain cleaning programs to increased pollutant removal efficiency.
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Outcome Title and Number:	Model Suspension Feeders (Menhaden) in Support of Multi-species Management LRS05-01
Cost Estimate Range:	FY 05-\$150,000 FY 06-TBD FY 07-TBD
Project Duration:	Multi-year: three years. A multi-year proposal should have a workplan and budget for 2005 and an estimated budget and outcomes for future years.
C2K Commitments:	<u>Multi-species Management</u> 1.4.1 - Assess the effects of different population levels of filter feeders such as menhaden, oysters and clams on Bay water quality and habitat. 1.4.2, 1.4.3 - Develop ecosystem-based multi-species management plans for targeted species; and revise and implement FMPs that incorporate ecological considerations, multi-species fisheries management and ecosystem approaches)
Additional Evaluation Criteria:	None.
Expected Outcomes:	Qualitatively characterise the role of suspension (filter) feeders including oysters, clams, menhaden and zooplankton, on Bay water quality and habitat. Analysis will develop critical components to the existing trophic model, EwE (Ecopath with Ecosim) currently under development and use by NOAA's Chesapeake Bay Program Office in co-ordination with the Fisheries Steering Committee for the Bay. The overall outcome will provide the basis for consideration of potential management options (e.g., oyster and menhaden management) and their subsequent impacts on upper trophic levels as well as water quality. For example, such models are used in fisheries management to assess harvesting pressures of oysters and menhaden on targeted species. However, such models also incorporate population dynamics of primary producers and primary consumers that establish the foundation of such trophic model. FY05 funding will focus on Menhaden.
Expected Methodology:	The accepted approach for such an effort was formulated at the CBP STAC Suspension Feeder Workshop in 2002. The analysis began the same year with general evaluations into potential influence of oyster population levels on Bay water quality and habitat. In 2003, funds were directed toward estimating consumption and model effects of various suspension feeders such as oysters and zooplankton on the available primary producers as recommended in the STAC report. This next step is to fully develop menhaden in EwE since they provide that critical, direct link between the phytoplankton and many ecologically and economically important species such as striped bass, bluefish and osprey. The potential influence of menhaden diseases on natural mortality will be considered.
Deliverables:	Utilizing the historical data set on menhaden abundance and distributions, conduct an extensive modeling analysis to characterize the potential effects of different population levels of water quality parameters and microzooplankton populations. Identify specific data gaps/needs and investigate ecosystem responses among plankton (menhaden prey), menhaden, and menhaden predators (such as striped bass, bluefish, and weakfish). A final report will be developed to include data documentation, results of sensitivity analyses, and recommendations for data needs and management.
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Outcome Title and Number:	Water Quality and Living Resource Data Analysis and Interpretation MASC05-01
Project Duration:	Multi-year: five years. A multi-year proposal should have a workplan and budget for 2005 and an estimated budget and outcomes for future years.
Cost Estimate Range:	\$150,000 /yr
Supported C2K Keystone Commitment(s):	By 2010, correct the nutrient and sediment related problems in the Chesapeake Bay and its tidal tributaries sufficiently to remove the Bay and the tidal portions of its tributaries from the list of impaired water under the Clean Water Act.
Additional Evaluation Criteria:	None.
Expected Outcomes:	This project translates water quality and biological resource monitoring data into information and recommendations useful to Chesapeake Bay restoration management and decisionmaking. The proposed analyses allow CBP partners to track progress towards management goals and to connect the Bay's water and habitat quality to the watershed and to living resources. This outcome provides support for a range of data analysis activities by academic, state and federal partner agencies, including: <ul style="list-style-type: none"> - Evaluation of tidal water quality monitoring data using the new Bay water quality criteria. - Preparation of critical information for managers and key stakeholders such as Basin Summaries. - Analysis of long-term water quality and biological community trends. - Diagnosis of causes for non-attainment of criteria and standards. - Integration of watershed, non-tidal Bay water quality monitoring and biological monitoring information.
Expected Methodology:	Methodologies include state-of-the art statistical techniques developed by experts working with the Bay Program's Tidal Monitoring and Analysis Workgroup. Methods are reviewed by outside experts and results are reviewed with the research community in an annual two-day workshop. If a project is selected, the applicant must prepare a Quality Assurance and Project Plan (QAPP) and a Quality Management Plan (QMP).
Form of Deliverables:	Deliverables include Basin Summary reports, presentations to managers and stakeholders, contributions to State of the Bay reports, online Chesapeake Bay Program watershed profiles, extensive web postings, environmental indicators, etc.
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