

University of Maryland Center for Environmental Science Implementation Plan

Areas of Focus

The University of Maryland Center for Environmental Science will implement relevant aspects of the USM’s 2020 Strategic Plan commensurate with its mission-driven research, graduate education and public service foci. While it will not contribute directly to the Theme 1—Access, Affordability and Attainment (College Completion)—goal it will implement programs that address the other USM strategic themes, specifically:

Theme 2. Maryland’s Economic Development and the Health and Quality of Life of Its Citizens

UMCES will contribute to meeting the goals of this System theme in five important ways: (a) by expanding a significant sponsored research enterprise (over \$27 million in new awards during FY 2010) that has significant direct economic impacts in the relatively rural regions where its laboratories are based and within related R&D sectors statewide; (b) by providing the knowledge and technical skills that enable Maryland’s traditional industries, such as fisheries, maritime commerce, forestry and agriculture, to operate sustainably; (c) by making discoveries with commercial applications in the new economy (e.g. sensor technology, drugs from the sea, and biofuels), throughout the Center but in particular through inter-institutional partnership in the Institute for Marine and Environmental Technology (IMET); (d) by participating in STEM education through its environmental science education programs involving students and teachers; and (e) by contributing to the development of a sustainable Maryland (“Smart, Green and Growing”) with the high quality of life needed to compete in the knowledge economy through strategic research and enhanced decision support capabilities.

Theme 3. Transforming the Academic Model to Meet the Need the Higher Education and Leadership Needs of Maryland’s 21st Century Students, Citizens and Businesses

Long a stalwart in one of the System’s most successful and highly rated graduate programs, Marine-Estuarine-Environmental Sciences, UMCES will assume the leadership of this program with the goal of transforming it to better prepare future researchers and working professionals so that they may meet the challenges of the 21st century, including adaptation to global climate change, restoration of large ecosystems, sustainable agriculture and aquaculture, and management of complex human-environmental systems. UMCES will also assist other System institutions with undergraduate programs in providing transformative experiences (including opportunities to participate in environmental research) and civic engagement.

Theme 4. Identifying New and More Effective Ways to Build and Leverage the Resources Available to the USM for the Benefit of Maryland and Its Citizens

UMCES will continue to be an effective steward of its resources by improving effectiveness and efficiency of its administration and operations and seeking private and non-state support. In addition, UMCES has a special responsibility of leadership with regard to the System's commitment to environmental sustainability, including participation of System-wide coordination and liaison with the other branches of state government.

Theme 5. Achieving and Sustaining National Eminence through the Quality of Our People, Our Programs, and Our Facilities

With the assumption of the leadership of the Graduate Program in Marine-Estuarine-Environmental Studies, UMCES will improve the quality, participation, and modern relevant experiences of graduate students. It will continue to stress recruitment, retention and participation in governance of its faculty and develop and support a high quality staff. It will provide outstanding facilities for its research and graduate student training, such as the state-of-the-art coastal research vessel *Rachel Carson* and through partnership in the newly formed Institute for Marine and Environmental Technology in Baltimore.

Strategies and Initiatives

While working to address all of these System themes through its programs and activities, UMCES is proposing two interrelated strategic initiatives that will allow it to achieve these goals more rapidly and effectively. UMCES is proposing investments of 5% of its base budget during each of two years, rather than 3% for each of five years. Because of its smaller size and budget, this level of resources is required to make a difference in any one year. Also, planning for these two new initiatives is relatively mature and the opportunities they address are time-sensitive.

1. Synthesizing Science for Environmental Decision Support

Maryland has a well-deserved reputation for progressive management of its environment and natural resources. Under the O'Malley Administration the standards have been raised because of its emphasis on information-driven decision-making and quantitative accountability measures, most notably through BayStat. Yet, there is much more that can be done to refine and empower environmental decision support to meet the steep challenges that lie ahead, including finally achieving Chesapeake Bay restoration goals, managing living resources sustainably, meeting smart growth objectives, adapting to climate change, and developing renewable energy alternatives.

Building on the international accomplishments of its Integration and Application Network and taking advantage of the new, National Science Foundation-supported Environmental Synthesis Center (EnSynC) to be developed in Annapolis, UMCES plans to develop leading-edge systems to support environmental decisions that

specifically address Maryland's sustainability requirements, but are also marketable to the world. This Center-wide initiative holds the promise of defining a new paradigm for how a mission-oriented academic sector can empower and improve environmental and resource decision making both within and outside of government. EnSynC will focus on issues identified by the environmental science community, nationally and internationally, facilitated by building and sustaining cyber-infrastructure for data management, analysis and modeling, including advanced visualization capabilities for decision-making. In addition to taking full advantage of this new capability within our state, UMCES will require bolstering its faculty expertise in the social sciences and environmental policy, environmental management of agriculturally dominated landscapes, climate change effects, and renewable energy transformation, particularly regarding offshore wind energy and algal biofuels. The accelerated construction of the long-planned Communications and Information building at the Center's Chesapeake Biological Laboratory is a critical enabling facility; however faculty members from all four UMCES Laboratories, including the Institute for Marine and Environmental Technology, and the Maryland Sea Grant College Program will participate in this initiative.

Although this initiative is highly relevant to System Theme 2 by improving well-being and quality of life in Maryland, in a very real way it would also enhance UMCES' contributions to the three other relevant themes, by providing transformative opportunities for graduate education for research scientists and environmental professionals, attracting philanthropic and other support to leverage the state investment, and enhancing the Center's reputation for the effective application of environmental science.

2. *Graduate Education in Environmental Sciences for the 21st Century*

The Environmental Decision Support initiative would provide substantial opportunities for training of graduate students to become adept at addressing the environmental challenges of the 21st Century. Thus, the first Decision Support initiative and the second on Graduate Education are closely coupled and interdependent.

The Graduate Education initiative is to empower UMCES management of the chronically under-resourced Graduate Program in Marine-Estuarine-Environmental Science (MEES), to ensure that its progressive transformation to a 21st Century-oriented program occurs, to enhance its competitiveness for the best students, and to stimulate an expansion into education of working professionals without the requirement for a thesis based on independent research.

The MEES Program provides an excellent starting point. It involves the participation by five USM institutions and involves a very diverse and deep faculty drawn from those institutions. Three of those institutions are the partners in the Institute for Marine and Environmental Technology; under leadership of a new IMET director this brings a powerful new dimension to MEES. In recent ratings of doctoral research programs, MEES received among the highest ratings among science programs within

the USM and ranked behind the only the most prestigious institutions in ocean science. Many ocean science programs are being merged or are expanding into broader marine and environmental science programs, while both MEES and UMCES already have that breadth and marketability. The USM now has the opportunity to advance this model and redefine graduate education in fields highly relevant to the new challenges faced by society in the 21st Century, including adaptation to global climate change, energy transformation, restoration of large ecosystems, and management of complex human-environmental ecosystems.

Strategic Plan - Implementation Plan - UMCES
Fiscal & Personnel Summary
FY 2012 - FY 2016
(in thousands)

| | FY 2012 | FY 2013 | FY 2014 | FY 2015 | FY 2016 |
|--|-----------------|-----------------|-----------------|-----------------|-----------------|
| Revenue: | | | | | |
| State Supported Appropriation | | | | | |
| Current Services (1) | \$748 | \$815 | \$889 | \$924 | \$961 |
| Strategic Enhancements (2) | \$935 | \$1,019 | \$0 | \$0 | \$0 |
| Tuition Supplement - market correction | | | | | |
| UG tuition rate | | | | | |
| Additional revenue | <u>0</u> | <u>0</u> | <u>0</u> | <u>0</u> | <u>0</u> |
| Subtotal - annual increase | \$1,683 | \$1,834 | \$889 | \$924 | \$961 |
| Grand Total State Supported Appropriation | \$20,383 | \$22,217 | \$23,106 | \$24,030 | \$24,992 |

| | | | | | |
|---|-----------------|-----------------|-----------------|-----------------|-----------------|
| Incremental Expenditures: | | | | | |
| Current Services Budget | 748 | 815 | 889 | 924 | 961 |
| Strategic Plan Themes - Dollars | | | | | |
| 55% College Degree Completion | 0 | 0 | 0 | 0 | 0 |
| Research & Competitiveness | 710 | 929 | 0 | 0 | 0 |
| Academic Transformation | 170 | 90 | 0 | 0 | 0 |
| Stewardship | 55 | 0 | 0 | 0 | 0 |
| Quality | <u>0</u> | <u>0</u> | <u>0</u> | <u>0</u> | <u>0</u> |
| Subtotal SP Enhancements | 935 | 1,019 | 0 | 0 | 0 |
| Total Annual Incremental Expenditures | \$1,683 | \$1,834 | \$889 | \$924 | \$961 |
| Total Increase in State Supported Base | \$20,383 | \$22,217 | \$23,106 | \$24,030 | \$24,991 |

| | | | | | |
|---|-------------|-------------|-------------|-------------|-------------|
| Strategic Plan Themes - Personnel: | | | | | |
| 55% College Degree Completion | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Research & Competitiveness | 4.00 | 4.00 | 0.00 | 0.00 | 0.00 |
| Academic Transformation | 2.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Stewardship | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Quality | <u>0.00</u> | <u>0.00</u> | <u>0.00</u> | <u>0.00</u> | <u>0.00</u> |
| Total Personnel Increase | 7.00 | 5.00 | 0.00 | 0.00 | 0.00 |

| | | | | | |
|--------------------------------------|-----|-----|-----|-----|-----|
| Budget Indicators: | | | | | |
| UG resident tuition rate | N/A | N/A | N/A | N/A | N/A |
| Enrollment growth - FTES | N/A | N/A | N/A | N/A | N/A |
| Institutional Financial Aid Increase | N/A | N/A | N/A | N/A | N/A |

Assumptions: State-supported increase - maximum of 7% (4% designated for Current Services - 3% targeted for enhancements)

- 1. Current Services (mandatory costs) will be funded by a 4% general fund increase**
- 2. UMCES Assumptions: Strategy of 5% general fund increase for 2 years**
- 3. COLA funding provided by State in addition to current services**

Strategic Plan - Implementation Plan - UMCES
Institutional Strategies

| | College Completion | Economic Competitive- ness | Academic Transformation | Stewardship | Quality and Eminence |
|---|-----------------------|----------------------------------|----------------------------|-------------|-------------------------|
| Theme 1 - College Completion | | | | | |
| 1.a. Expand access/enrollment | | | | | |
| Primary Institutional strategies: | | | | | |
| 1.b. Increase affordability | | | | | |
| Primary Institutional strategies: | | | | | |
| 1.c. Improve degree completion | | | | | |
| Primary Institutional strategies: | | | | | |
| Theme 2 - Economic Competitiveness | | | | | |
| 2.a. Develop and recruit new companies | | | | | |
| Primary Institutional strategies: | | | | | |
| -- | | | | | |
| 2.b. Enhance R&D competitiveness | | | | | |
| Primary Institutional strategies: | | | | | |
| -- Enhance decision support | | | | | |
| | | P | | x | x |
| -- Add strategic faculty | | | | | |
| | | P | x | x | x |
| 2.c. Strengthen tech transfer | | | | | |
| Primary Institutional strategies: | | | | | |
| -- Staff an UMCES Tech Transfer position | | | | | |
| | | P | | | x |
| 2.d. Increase graduates in critical areas | | | | | |
| Primary Institutional strategies: | | | | | |
| -- Prepare highly skilled MEES MS PhD grads | | | | | |
| | | P | | | x |
| -- Establish env field related professional programs | | | | | |
| | | P | | | x |
| Theme 3 - Academic Transformation | | | | | |
| 3.a. Course Re-design & related strategies | | | | | |
| Primary Institutional strategies: | | | | | |
| -- Reform nationally recognized MEES program | | | | | |
| | | | P | x | x |
| -- Provide undergrad transformative exp. & civic | | | | | |
| | x | | P | | x |

**Strategic Plan - Implementation Plan - UMCES
Institutional Strategies**

| | College Completion | Economic Competitive- ness | Academic Transformation | Stewardship | Quality and Eminence |
|---|-----------------------|----------------------------------|----------------------------|-------------|-------------------------|
| 3.b. Systematic support of transformation | | | | | |
| Primary Institutional strategies: | | | | | |
| --Provide advanced fac. training in learning tech | | | P | | x |
| 3.c. Develop & implement Maryland Compact | | | | | |
| Primary Institutional strategies: | | | | | |
| -- | | | | | |
| -- | | | | | |
| Theme 4 - Stewardship | | | | | |
| 4.a. Effectiveness and Efficiency | | | | | |
| Primary Institutional strategies: | | | | | |
| -- Expanded cost containment effort | | | | P | |
| -- | | | | | |
| 4.b. Expand philanthropic efforts | | | | | |
| Primary Institutional strategies: | | | | | |
| -- Establish new donors program | | | | P | x |
| -- Increase professional support | | | | P | |
| Theme 5 - Quality and Eminence | | | | | |
| 5.a. Recruit "best and brightest" students | | | | | |
| Primary Institutional strategies: | | | | | |
| -- Create env. professional prgrams | | | | | P |
| 5.b. Attract & retain quality faculty | | | | | |
| Primary Institutional strategies: | | | | | |
| -- | | | | | |
| -- | | | | | |
| 5.c. Attract & retain quality staff | | | | | |
| Primary Institutional strategies: | | | | | |
| -- | | | | | |
| -- | | | | | |
| 5.d. Build & maintain world-class facilities | | | | | |
| Primary Institutional strategies: | | | | | |
| -- Move Capital Info/comm. Bldg forward to FY13 | | | x | | P |

University of Maryland Center for Environmental Science Implementation Plan

Impact of the FY 2012 Allowance

The UMCES Implementation Plan is aggressive in that it is based on forward funding over two fiscal years in order to provide sufficient resources given the size of the institution and respond to time-sensitive opportunities to develop and provide scientific decision support and graduate education reform. Therefore, the FY 2012 Allowance presents a considerable set-back and risks losing exceptional opportunities. Specific impacts regarding the two initiatives are follows:

1. Synthesizing Science for Environmental Decision Support

The Environmental Synthesis Center (EnSynC) will be initiated and supported by the National Science Foundation as of the beginning of FY 2012. While funds for the facility space rental are included in the Allowance, the programmatic enhancements required to take full advantage of the capabilities and momentum of this exciting new center are not. UMCES will have to delay substantially its efforts to capitalize on the new center by applying these resources to solve Maryland's sustainability challenges and to develop revenue-generating services that can be marketed on a global scale. Time is of the essence in building the decision-support required to ensure that the state's BayStat process achieves efficient and verifiable results in achieving legally mandated Chesapeake Bay restoration goals. Maryland has committed to achieve these goals by CY 2020, so the next four years of the O'Malley Administration will be critical. Without the funds required for this initiative included in the FY 2012 Allowance, the envisioned Decision Support system could not be functional until, at best, the beginning of the third year of the term of this Administration.

2. Graduate Education in Environmental Sciences for the 21st Century

UMCES is prepared to assume management responsibilities for the MEES Program under the FY 2012 Allowance, provided appropriate administrative support funds are internally reassigned. While we would strive to implement improvements and not just act as a caretaker, effective transformation of the program to a nationally distinctive program capable of competing for the best students would be delayed. Enrollments would remain static and UMCES would not be able to initiate educational programs for working professionals under the FY 2012 Allowance.

In addition to these initiatives, the FY 2012 allowance will stress operations budgets that support research competitiveness. Coupled with the lack, at this point, of a Federal budget for FY 2011 and expected constraints if not reductions of the budgets of Federal science agencies for FY 2012, UMCES will be hard pressed to maintain the level of grant and contract awards at FY 2010-FY 2011 levels. In addition, the planned investment in technology transfer will make it virtually impossible to make any headway on the development of spin-off companies during FY 2012.

**Strategic Plan - Implementation Plan - UMCES
Fiscal & Personnel Summary
FY 2012 Impact Statement
(in thousands)**

| | FY 2012 IP Original | FY 2012 Allowance |
|--|------------------------|----------------------|
| Revenue: | | |
| State Supported Appropriation | | |
| Current Services | \$748 | \$455 |
| Strategic Enhancements | \$935 | \$0 |
| Tuition Supplement - market correction | | |
| UG tuition rate | | |
| Additional revenue | <u>0</u> | <u>0</u> |
| Subtotal - annual increase | \$1,683 | \$455 |
| Grand Total State Supported Appropriation | \$20,383 | \$19,155 |

| | | |
|--|----------------|--------------|
| Incremental Expenditures: | | |
| Current Services Budget | 748 | 673 |
| Strategic Plan Themes - Dollars | | |
| 55% College Degree Completion | 0 | 0 |
| Research & Competitiveness | 710 | 374 |
| Academic Transformation | 170 | 0 |
| Stewardship | 55 | (592) |
| Quality | <u>0</u> | <u>0</u> |
| Subtotal SP Enhancements | 935 | (218) |
| Total Annual Incremental Expenditures | \$1,683 | \$455 |

EnSynC Matching Grant
Reductions/reallocations to balance budget & research initiatives above.

| | | |
|---|-------------|-------------|
| Strategic Plan Themes - Personnel: | | |
| 55% College Degree Completion | 0.00 | 0.00 |
| Research & Competitiveness | 4.00 | 0.00 |
| Academic Transformation | 2.00 | 0.00 |
| Stewardship | 1.00 | 0.00 |
| Quality | <u>0.00</u> | <u>0.00</u> |
| Total Personnel Increase | 7.00 | 0.00 |

| | | |
|--|-----|-----|
| Budget Indicators: | | |
| UG resident tuition rate | N/A | N/A |
| Enrollment growth- FTES | N/A | N/A |
| Institutional Financial Aid Increase(CSB+Enhancements) | N/A | N/A |

| Strategic Plan - Implementation Plan - UMCES | | | |
|---|---|--|---|
| Impact of FY 2012 Budget on Institutional Strategies | | | |
| | Narrative of impact | If applicable, Dollar impact in FY 2012 | If applicable, impact on Enrollment in FY 2012 |
| Theme 1 - College Completion | | | |
| Financial Aid | not applicable | | |
| Admissions Denied | | | |
| STEM Admissions Denied | | | |
| <i>Institutional specific</i> | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| Theme 2 - Economic Competitiveness | | | |
| Tech Transfer/Company Creation | A position for a technology transfer professional to focus on UMCES faculty would not be established in FY 2012. UMCES would continue to use the resources of other USM institutions. | | (-1) |
| Grant/Contract Funding | Without additional research facilities and faculty, growth in extramural funding is stalled. | | (-\$2.5m) |
| <i>Institutional specific</i> | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| Theme 3 - Academic Transformation | | | |
| Courses Re-designed | MEES transformation minimized | | |
| <i>Institutional specific</i> | | | |
| 1. | Creation of MEES professional and workforce courses delayed | | |
| 2. | | | |
| 3. | | | |
| Theme 4 - Stewardship | | | |
| <i>Institutional specific</i> | | | |
| 1. | Potential development opportunities missed. | | |
| 2. | | | |
| 3. | | | |
| Theme 5 - Quality and Eminence | | | |
| Faculty complement | Without resources to recruitment of premier research faculty the ability to maintain status as one of pre-eminate institutions in environmental sciences is strained. | | |
| Student quality | | | |
| <i>Institutional specific</i> | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |