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TO: RI Bays, Rivers, and Watersheds Coordination Team

FROM: RI Environmental Monitoring Collaborative (RIEMC)

DATE: November 16, 2005

As you requested at your meeting on 28 September, we provide here a concise review of the priority monitoring activities that we recommend be conducted by the Environmental Monitoring Collaborative during the 2005-2006 work year. The list of activities we identify have been discussed by the RIEMC and reviewed by the Coordination Team and the Science Advisory Committee of the Coordination Team. Furthermore, the activities we identify here are all high priority monitoring endeavors as judged by the prioritization process you commissioned in the Spring 2005.

Some of our monitoring recommendations require funding. There is a clear need to invest in the capacity of state agencies to conduct ambient monitoring as outlined in the RI Water Monitoring Strategy, the RIEMC January 2005 Report, and the SAC review of the RIEMC report. The FY2007 shortfalls in the water monitoring programs that have been advanced in the DEM framework or the RIEMC report are listed below (figures are the shortfall in direct costs after available funds are subtracted from projected program total costs).

- *Fixed-site monitoring in Narragansett Bay (DEM) - \$239,000*
- *Dissolved oxygen surveys (DEM/NBEP) - \$42,500*
- *Large river monitoring by USGS on a monthly basis (DEM) - \$195,000*
- *Rotating assessments of coastal waters (DEM) - \$250,000*
- *Rotating basin assessments of rivers and streams (DEM) - \$360,000*
- *Expansion of beach monitoring -freshwaters (DOH) - \$100,000*
- *Lake & stream monitoring (URI Watershed Watch) - \$80,000*
- *Fish tissue monitoring - freshwaters only (DEM) - \$105,000*
- *RIEMC administrative coordination and support - \$66,000*
- *Development of an invasive species monitoring plan (RINHS) - \$150,000*
- *USGS streamflow monitoring (WRB) - \$242,000*
- *Emergency response data review (RIEMC) - \$11,350*
- *Monitoring development grants program (RIEMC) - \$125,000*
- *Database capacity assessment (RIEMC) - \$53,000*

We seek your approval and endorsement of our work plan for 2006. Furthermore, we ask that you include our budget needs in the Coordination Team FY2007 budget request to the Governor and General Assembly.

RI Environmental Monitoring Collaborative¹

Environmental Monitoring Activities and Needs For 2006

Presented to the RI Bays, Rivers, and Watersheds Coordination Team

November 16, 2005

As required by statute, the Rhode Island Environmental Monitoring Collaborative (RIEMC) submitted an environmental monitoring framework to the RI Bays, Rivers, and Watersheds Coordination Team (CT) in January 2005. At the request of the CT the RIEMC prioritized each of the major elements in the January framework. The CT conveyed the January report to the Science Advisory Committee (SAC) for review of the framework. The SAC provided an initial assessment in May 2005 and a comprehensive assessment in July 2005. The members of the RIEMC have carefully reviewed the SAC assessment to identify priority action items that must be addressed immediately to advance the work of the RIEMC. We used project costs that were provided in the January 2005 RIEMC report or updated for this report to reflect changes in scope and/or scale of projects. The RI Natural History Survey and the DEM Office of Water Resources has provided extensive comments on the SAC review and they can be obtained under the online resource page of the RIEMC web site. Our comments on the findings of the SAC review and our priority list of environmental monitoring needs and actions is provided here.

1. The SAC is to be commended for its thorough and thoughtful review of the RIEMC January 2005 report and the RI Department of Environmental Management Water Monitoring Framework for RI. The RIEMC is grateful for the time and effort the SAC gave the review process.
2. The SAC advocates that monitoring activities must support management needs and assessment of program effectiveness (SAC Review Tier I, Section 2). The RIEMC concurs with this recommendation. The RI state agencies that are responsible for the management and stewardship of our ecosystems and natural resources are members of the RIEMC, therefore, it is incumbent upon them to ensure that recommendations advanced by the RIEMC support their

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Institutional Partners: Jim Campbell, *US Geological Survey*; Margherita Pryor, *EPA Region 1*; Norman Rubinstein, *EPA Atlantic Ecology Division*; Donald Pryor, *RI Bays, Rivers, and Watersheds Coordination Team Science Advisory Committee*; Chip Young, *RI Bays, Rivers, and Watersheds Coordination Team Public Advisory Committee*; Ken Raposa, *NOAA Prudence Island Estuarine Research Reserve*; David Gregg, *RI Natural History Survey*; Barry Costa-Pierce and Ames Colt, *RI Sea Grant*; Bryan Milstead and Beth Johnson, *U.S. National Park Service Inventory and Monitoring Program*; Marci Cole, *Save the Bay*; Christopher Deacutis and Richard Ribb, *Narragansett Bay Estuary Program*

management programs. Furthermore, environmental monitoring activities conducted by state agencies, or supported by funds provided by state agencies, should be vetted through the RIEMC to ensure that the core monitoring principles adopted by the RIEMC and articulated in the January Report are fully met.

- a. **ACTION ITEM:** The RIEMC requests that the Coordination Team require that the Department of Environmental Management, the Coastal Resources Management Council, the Narragansett Bay Commission, the Department of Health, the RI Rivers Council, and the Water Resources Board agree to:
 - i. On an annual basis, notify the RIEMC of planned monitoring programs noting the geographic targets and any significant changes from past practice. The RIEMC, with input from SAC as needed, may review and comment on monitoring programs to foster coordination, evaluate progress, and identify gaps in the overall environmental monitoring strategy for Rhode Island.
 - ii. Submit all new monitoring initiatives to the RIEMC for review and comment.
 - b. **ACTION ITEM:** In the interests of efficient collective action by all parties engaged in environmental monitoring and natural resource management, public and private, the RIEMC requests that the Coordination Team recommend:
 - i. That academic, non-profit, and private parties contemplating monitoring in Rhode Island and shared watersheds with neighboring states adopt the core monitoring principles in the January report, and inform the RIEMC of new or modified monitoring initiatives. The RIEMC, with input from SAC as needed, may review and comment on monitoring programs to foster coordination, evaluate progress, and identify gaps in the overall environmental monitoring strategy for Rhode Island and watershed regions outside the state.
3. The SAC review recommends that all monitoring efforts be coordinated by agencies that have management responsibility (SAC Review Tier I, Section 4). The RIEMC concurs that it is essential that management agencies play a lead role in the design and implementation of monitoring activities. Where the state is providing funding, management agencies should have a prominent role (contractual, MOU, managing partner, advisory) in the monitoring programs. However, in some circumstances the day to day management of monitoring will be accomplished by non-governmental, academic, or other entities. It is not practical to require that management agencies coordinate all monitoring programs; nevertheless, the state bears the responsibility to ensure that the environmental monitoring strategy is adequately meeting the needs of state programs and decision-makers. There are institutions in RI that do not have management responsibility but do coordinate important long-term monitoring

- initiatives; examples include URI's Watershed Watch, the GSO fixed station surveys of fish and plankton, Surfrider Foundation beach monitoring, Kingston Wildlife Research Station and Block Island bird banding programs, URI Geosciences beach profile monitoring, and the EPA/URI National Coastal Assessment monitoring of Narragansett Bay. Inasmuch as the RIEMC consists of the major resource management agencies as well as non-management institutions (academic, NGO's), the SAC recommendation that management agencies play a significant role in designing and implementing monitoring activities can be met without mandating who the coordinating agency shall be.
4. The SAC recommends that a competitive process be followed when seeking proposals for monitoring activities (SAC Review Tier I, Section 4). The RIEMC fully concurs with this recommendation and will use whenever possible and practical a competitive process to develop and implement new monitoring programs. Furthermore, the RIEMC encourages public agencies to use a competitive process when seeking technical expertise to conduct data collection, analysis, synthesis, dissemination, and reporting when these activities fall outside the scope or resource availability of the agency.
 5. The SAC recommends that data management and data access be given higher priority (SAC Review Tier I, Section 3). The RIEMC concurs. While work to enhance data management in specific programs is underway within agencies, there remains a need for a comprehensive review of the data management needs to support systems-level planning and reporting on key indicators.
 - a. **ACTION ITEM:** As described in section 6.B.3 of the RIEMC January report, the RIEMC requests funding (anticipated amount is \$53,000 in direct costs) from the Coordination Team to conduct a thorough review of the data management and Internet-based data distribution capacity of major monitoring agencies in RI. We will provide modest data and metadata distribution services for agencies that are not able to do so. An RFP and open competition to perform this task will be administered by the RIEMC.
 6. The SAC indicated its support for the monitoring programs embodied in the Governor's 2005 budget proposal noting that they will significantly improve the state of knowledge of Rhode Island's bays, rivers and lakes. While refinement of these strategies is expected to continue, there is consensus that core ambient monitoring programs need to be supported to ensure continued collection of data critical to management needs. In particular, the SAC noted that monthly water quality monitoring at USGS stations on larger rivers should be resumed. In addition, the SAC agreed with the need to expand the streamflow gage network. The RIEMC concurs with these comments.
 - a. **ACTION ITEMS:** The RIEMC requests that sufficient funds be provided to DEM's budget to sustain and enhance existing priority ambient monitoring programs as recommended in the RI Water Monitoring Strategy. At this moment, the following priority elements in the DEM water monitoring framework are either unfunded or underfunded. To

implement each of the activities would require additional funding at approximately these levels:

- i. Fixed-site monitoring in Narragansett Bay - \$239,000
 - ii. Dissolved oxygen surveys - \$42,500
 - iii. Large river monitoring by USGS on a monthly basis - \$195,000
 - iv. Rotating assessments of coastal waters - \$250,000
 - v. Rotating basin assessments of rivers and streams - \$360,000
 - vi. Volunteer monitoring of lakes and streams - \$80,000
 - vii. Fish tissue monitoring - freshwaters only - \$105,000
 - b. The RIEMC requests that additional funds be provided to the RI Department of Health to allow the expansion of the beach monitoring program to include freshwater beaches (anticipated total direct cost is \$100,000).
 - c. The RIEMC requests that additional contractual funds be provided to the Water Resources Board (WRB) budget to allow the expansion of the streamflow gage network by ten stations (anticipated total direct cost of installation is \$140,000 and \$102,000 for annual operating expenses).
7. The SAC had a number of technical questions and recommendations concerning the rotating basin approach to sample rivers, streams, ponds, and embayments (SAC Review Tier II, Section 1). While DEM believes the approach meets its primary purpose of screening for impaired waters, the SAC comments noted the limitations of the sampling frequency with respect to measuring trends in water quality over time as well as issues related to interpretation. Furthermore, the SAC recommended that the current protocol for sampling freshwater macroinvertebrate be modified to use a larger number of specimens in each sample to generate data of greater value to discerning declines in water quality, possibly before an impairment is evident. The DEM has provided detailed comment on the questions posed in the SAC review and these are available on the RIEMC web site.
- a. **ACTION ITEM:** DEM will make presentations on the initial results of the rotating basin demonstration project and also organize, in collaboration with the RIEMC and SAC, a workshop to review the approach in greater detail. A day-long workshop with DEM water monitoring scientists and others with expertise in the design of sampling methodologies will be aimed at identifying modifications to the monitoring approach for rivers and streams that would be beneficial to resource management. The workshop goal will be to identify how to adapt existing monitoring strategies to better meet a broader range of water quality data needs pertaining to river and streams.
8. The SAC requested that a comprehensive database and monitoring program be developed to measure the effectiveness of storm water and waste water management activities. Due to the status of many of the existing records, this is an ambitious undertaking.

- a. **ACTION ITEM:** Provided administrative funding can be made available to the RIEMC (see #14 below), the RIEMC should establish a technical review team to define and develop the storm water and waste water tracking system and associated monitoring activities. The review team should establish roles, goals, and costs for such a system and report this to the RIEMC, CT, and SAC. We request SAC assistance in this process.
9. The SAC recommends a number of enhancements to fisheries monitoring in RI (SAC Review Tier II, Section 5). We concur that a comprehensive marine fish and shellfish (commercial and non-commercial) monitoring assessment needs to be conducted and proposals developed to expand the geographic extent, protocols adopted, technologies used, and timely data synthesis and reporting of status and trends of marine fish and shellfish in RI. Furthermore, we concur that critical fish habitat be defined, mapped and monitored (SAC Review Tier III, Section C2)
 - a. **ACTION ITEM:** The RIEMC will allocate a portion of our competitive monitoring research grants allocation (see 14.b) to be used to support the development of a comprehensive review of fish and shellfish monitoring in RI, recommend changes to existing monitoring activities, and propose new monitoring activities that will ensure adequate measurement of target species (demersal and pelagic, commercial and non-commercial), definition of critical fish and shellfish habitat, monitoring data analysis and synthesis, and information dissemination. This work will be described in an RFP and an open competition conducted to identify the best possible team to conduct this assessment. The project will be administered through the RIEMC by a project management team consisting of fisheries scientists from DEM, URI, and NOAA NMFS.
10. The SAC questioned the management value of the watershed-based land cover and impervious surface monitoring proposal in the January report (SAC Review Tier III, Section B1). We concur with the SAC's comments on the need for high resolution large scale RI-centric land cover mapping and change analysis, especially for riparian habitats. The 2003-2004 land cover remapping project underway by the RI Office of Statewide Planning will provide essential data to support that assessment. However, the RIEMC is committed to watershed-scale monitoring; for Narragansett Bay this includes large areas of Massachusetts. Nevertheless, we concur that a strong tie between land cover change metrics and management decisions must be established before implementing a watershed-scale change assessment.
 - a. **ACTION ITEM:** Provided that administrative funding can be made available (see #14 below), the RIEMC will continue its work with the land cover mapping community and consumers of land use and land cover data to clearly identify management programs at a variety of levels (regional, state, municipal) that do use or potentially could use these data and will solicit descriptions from them of specific data uses and the management programs they serve. The RIEMC will develop technical specifications and funding proposals to create the land cover datasets that meet the information needs of the resource management community.

11. The SAC recommends supporting the invasive species monitoring proposal in the January report (SAC Review Tier III, Section B2). We concur.
 - a. **ACTION ITEM:** The Rhode Island Natural History Survey should be engaged to develop an invasive species monitoring and response plan for RI (anticipated total direct cost of \$150,000). The plan should include monitoring for terrestrial, aquatic, and marine organisms. The plan should be developed in close partnership with the RI Invasive Species Council, DEM, and CRMC. Special attention should be given monitoring for specific invasive plant and animal species that are expected to have a high probability of occurrence in RI ecosystems or would cause extreme loss of ecological function if they became established. A detailed budget and work plan will be provided when required. The elements of the work plan are articulated in the RIEMC January report.
12. The SAC had a number of recommendations concerning nutrient monitoring in Narragansett Bay and the coastal ponds (SAC Review Tier III, Section B3).
 - a. **ACTION ITEM:** The RIEMC is currently working with NOAA NMFS to migrate Nu Shuttle plankton data to the WWW.NARRBAY.ORG data portal.
 - b. **ACTION ITEM:** The RIEMC will entertain the biological productivity proposals in its January report as research activities in support of environmental monitoring in RI. See #16.b. below.
13. The SAC had many recommendations with respect to eelgrass and macroalgae monitoring (SAC Review Tier III, Section B4). Much has occurred on these two fronts over the summer of 2005 and the current status and needs for eelgrass and macroalgae monitoring needs to be reassessed.
 - a. **ACTION ITEM:** Provided administrative funding can be made available to the RIEMC (see #14 below), the RIEMC will prepare an update to eelgrass and macroalgae monitoring based on what was and was not accomplished in the summer of 2005.
14. The SAC supports the request for administrative support for the RIEMC (SAC Review Tier III, Section B4 [this section is identified with a typographic error and should be B5]). We concur.
 - a. **ACTION ITEM:** The RIEMC requests staff support for program coordination and administration (approximate total direct cost of \$66,000; 0.5 FTE). The RIEMC will determine the appropriate staff configuration to carry out its responsibilities. Any one of the institutions participant in the RIEMC may administer these funds but the RIEMC will determine how these funds will be spent.
15. The SAC recommends that the RIEMC establish a plan to remap wetlands in RI (SAC Review Tier III, Section C1). We concur with this recommendation and have initiated stakeholder discussions of the data required to support a wetlands remapping effort to meet management needs.

- a. **ACTION ITEM:** Provided administrative funding can be made available to the RIEMC (see #14 above), the RIEMC will continue its deliberations with the wetland mapping community to develop a plan to remap wetland habitats in the state in a manner that will meet the needs of wetland resource management community.
16. The RIEMC made a number of recommendations in its January report which the SAC did not object to. The following **ACTION ITEMS** are recommendations made in the January Report that received extremely high rankings in previous prioritization exercise.
- a. **ACTION ITEM:** The RIEMC requests \$11,350 (total direct costs) as described in our January report to inventory critical data required in response to environmental emergencies. Once data gaps are known we will develop proposals to fill the information voids. Hurricanes Katrina/Rita, as well as our October rains clearly demonstrated the need for ready access to current and reliable data on flood risk, emergency service facilities, escape routes, etc. Core data such as these must be immediately accessible during an emergency. If data gaps are discovered during an emergency response, it is too late.
 - b. **ACTION ITEM:** The RIEMC requests \$125,000 (total direct costs) as described in our January report to develop an environmental monitoring grants program to support the development of protocols, metrics, and monitoring systems that will support the goals of the CT and RIEMC. As is evident in this report, there are many management-critical monitoring questions that need to be answered to ensure the state is collecting the data it requires. A competitive grants program will allow us to tailor the annual RFP to meet the information needs of the moment. We are adopting an adaptive management model for monitoring in Rhode Island and this is an important component of that.