



**Reference SON:** *2014 ER-24  
Watershed Level Effects of  
Multiple Ecosystem Restoration*

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Bay Estuarine Research  
Reserve, NOAA Restoration  
Center, RI Coastal Resources  
Management Council, RI  
Division of Fish and Wildlife,  
Save the Bay, USFWS*

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**Upcoming Activities**

**Reports/Interim Results**

**Images**

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## Watershed Level Effects of Multiple Ecosystem Restoration Projects<sup>1</sup>

### Research Need

Since the Water Resources and Development Act of 1986 (WRDA) re-established and refined the federal interest in water resources development, and added an ecosystem restoration mission, USACE – independently and in cooperation with other agencies – has completed numerous ecosystem restoration projects throughout the United States. The benefits of these projects, where designed and executed in isolation from the larger landscape, has come into question however. There is a perceived benefit to designing discrete ecological restoration projects in a manner that considers multiple objectives and the physical and environmental linkages that exist on a watershed scale.

Watershed level planning, however, presents a number of challenges, including the constraints of agency mission areas and the need for broader, more comprehensive – and costly – supporting planning studies. Such studies may be difficult to support in the current 3x3x3 planning process climate as well. As a result, project sponsors are often focused on planning for a specific site.

Despite the lack of connection in the planning and execution phases, many of these discrete projects may have nonetheless resulted in greater, though undocumented, realized benefits at larger ecosystem and watershed scales. An assessment of the cumulative and interrelated effects of multiple ecosystem restoration projects could quantify and demonstrate the added function and value provided by completed and future projects – i.e., a post-project cumulative assessment at the watershed scale.

### Project Objectives & Plan

This project will examine multiple completed projects and projects currently planned in the Narragansett Bay watershed in an attempt to display and quantify the interrelationship among the projects as well as between the projects and the surrounding ecosystems. The assessment will demonstrate the cumulative benefits of the restoration investments over

the past two to three decades providing the basis for the development of a general methodology for assessing benefits of multiple discrete projects by documenting changes in ecosystem quality and function at a watershed scale taking advantage of synergies and inter-connectedness among projects.

The primary deliverable will be a proof of concept demonstration of the cumulative effects assessment approach applied at the watershed scale. The capability developed will be used for demonstrating the aggregate value to the watershed of multiple local projects completed over time. Once developed, the approach will be available for widespread use to encourage application in other watersheds throughout the USACE. The primary written deliverables will include a Technical Report and manuscript for peer-reviewed publication illustrating the demonstration of the approach in Narragansett Bay, Rhode Island. Deliverables will be co-developed with District collaborators to ensure that the products are useful and understandable to a broad audience.

## Payoff

This work develops an approach that is a transparent, defensible assessment of the cumulative effects of USACE project activities at the watershed scale. The approach will be used to identify and, to the extent possible, quantify the ecosystem benefits resulting from NAE and other agency work in the Narragansett Bay watershed during the past 20 years. The approach will assist the Civil Works Transformation process by adding efficiency in identifying aquatic ecosystem restoration benefits. The approach will be developed for use on future projects but generalized for multiple USACE needs.

## Products

### Journal Articles

Foran, C.M., Fox-Lent, C., Gendron, W., Oliver, L., Monroy, E., Turek, J., Edwards, P. and Suedel, B. (In review). Ecosystem benefits of multiple restoration projects in Narragansett Bay. *Environmental Management*.

### Technical Reports (TRs)

Foran, C.M., Fox-Lent, C., Chaderton, C., Gendron, W., Oliver, L., Monroy, E., Turek, J., Edward, P. and Suedel, B. (2018). Watershed level effects of multiple ecosystem restoration projects (ERDC/EL TR-18-10), Technical Report. U.S. Army Engineer Research and Development Center, Vicksburg, MS.

<sup>1</sup>Project Alias – Work Unit Documentation Title: *Watershed Level Effects of Multiple Ecosystem Restoration Projects*