

## **MONITORING THE RESTORATION OF RED BROOK, A SMALL COASTAL STREAM IN SOUTHEASTERN MASSACHUSETTS**

*Ellen M. Douglas<sup>1</sup>, Steven L. Kichefski<sup>1</sup>, Barry Fradkin<sup>1</sup>, Allen M. Gontz<sup>1</sup>, Beth C. Lambert<sup>2</sup> and Tim A. Purinton<sup>2</sup>.*

<sup>1</sup>Environmental, Earth and Ocean Sciences, University of Massachusetts, Boston

<sup>2</sup>Massachusetts Riverways Program, Department of Fish and Game.

Massachusetts is putting considerable time and investment into improving regional watersheds for public safety, community use, and ecological integrity. One major aspect of this effort involves restoring rivers and streams by removing unsafe or obsolete dams and obstructions to reconnect natural and cultural river communities. Despite the importance of sediment concentrations in water quality, little has been done in Massachusetts or elsewhere to document the long term impacts of dam removal on sediment transport and its ultimate impact on the local watershed. We are monitoring the restoration of Red Brook, a 4.5 mile small, spring-fed, coastal stream which is currently on the priority projects list of the Massachusetts Riverways Program. The long-term goal of the Red Brook Restoration project is to naturalize the stream and restore its function by removing man-made flumes, eliminating sources of unnatural sedimentation, and enhancing habitat for anadromous fishes, specifically sea-run brook trout. We are using in-situ measurements, geophysical techniques and a remotely-accessed environmental sensor network to monitor flow and sediment movement in the Brook before and after the flume removal. In summer 2008, we quantified the extent of sediment deposits that have built up behind several flumes (upper, middle and lower) in the Brook. As part of the Red Brook restoration plan, the upper flume was removed in September 2008; we are currently monitoring changes in channel geomorphology in response to this removal. We are also calibrating a HEC-RAS model that will be used to assess the impacts of the removal of the other flumes in the future. Preliminary results will be presented that compare pre- and post-restoration conditions in the Brook as well as evaluate the effectiveness of restoration activities in restoring sea-run brook trout habitat.