M. Stephen Ailstock, Ph.D.
Environmental Scientist

331 Ternwing Dr.
Arnold, MD 21012
(410) 647-3823
ailstock@erols.com

To whom it may concern,

The two major contributors to water quality decline world-wide are excess sediments and excess nutrients coming from the land. In many areas the cause of these contributions is erosion along shorelines. The rates of erosion can be reduced in these areas through shoreline stabilization of which there are three general types. Shorelines can be protected through hardening by the installation of such structures as bulkheads and rock revetments. These techniques are generally referred to as structural shoreline stabilization. Hardening techniques curtail erosion but offer little in the way of natural habitats for resident biota. Some shorelines can be protected by a "soft" approach through the creation of fringe wetlands using aquatic vegetation. This technique is commonly referred to as non-structural stabilization. Unfortunately, stabilization through wetlands creation alone is limited in many areas because the energy of erosive forces exceeds the ability of the vegetation to persist and prosper. A hybrid of these two approaches uses an offshore structure to mitigate wave energy while leaving an inter-tidal or fringe zone of natural sediments that may then be vegetated to provide additional shoreline protection and the benefits of wetlands. This type of stabilization is often called bio-structural shoreline stabilization. It offers the durability of hardening techniques while providing the benefit of preserving and in cases creating improved aquatic habitats.

The physics of offshore breakwaters is simple. When waves contact an offshore structure, turbulence occurs which results in a reduction of energy that will be superimposed on the shoreline. Depending on the amount of energy dissipated, sediments carried in the water may settle behind the breakwater creating new gently sloping fringe beaches that can be successfully colonized by a variety of aquatic flora and fauna. Although many materials may be used to form breakwaters, wood sills, rock, crushed concrete and prefabricated concrete modules, the efficiency of stabilization and energy dissipation is affected by size of the breakwater, placement, water depth, sediment type, material used, geometry of the breakwater and erosive energy. While many materials can work as breakwaters for stabilizing shorelines, if properly engineered and placed, some materials afford advantages over others for breakwater creation. Pre-cast concrete breakwaters like Beach Prisms offer advantages of ease of installation, improved energy dissipation and sediment capture, longevity of the concrete material in marine environments and resistance to displacement both by humans and natural forces. In many locations, both landward and offshore sediments are accreted and are stabilized by aquatic vegetation from natural recruitment and in cases by supplemental plantings. In these cases, maximum benefit for erosion control and water quality improvement is achieved.

My personal experience with Beach Prisms has been positive and I believe they have application for the stabilization of shorelines in many systems common to the Chesapeake Bay. They offer an additional tool for stabilizing sediments that are superior to many others for maximizing functional inter-tidal and sub-tidal habitats.

M. Stephen Ailstock

Phone 410-647-3823
Email Steve@Ailstock.com