



# ***Facts About...***

## ***Shoreline Stabilization***

### ***How to Select a Shoreline Stabilization Practice***

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Erosion and sedimentation (the deposition of sediment) are natural processes, but often are in conflict with our use of the shoreline. The most noticeable problem created by erosion is the loss of waterfront property. Waterfront property values are high, so many owners spend considerable time and money protecting their shoreline from erosion.

#### **DETERMINING THE NEED FOR SHORE EROSION PROTECTION**

The loss of property resulting from shore erosion is a serious problem for many waterfront property owners. It is important to determine the degree of erosion to your waterfront property before you or your community decide on a plan of action.

To determine if a shore erosion problem exists, you should consider the following questions.

- Has your shoreline noticeably receded during the last two years?
- If you have marsh along your shoreline, has it been disappearing?
- Do you have to step down to walk on your beach?
- Are trees along your shoreline falling into the water?
- Is your beach submerged at high tide?
- Have your neighbors installed shore erosion control measures?

If you answer yes to one or more of these questions you should contact the Tidal Wetlands Division in MDE at (410) 537-3837, or Shore Erosion Control Program in DNR, at (410) 260-8909 or (410) 260-8926, the local Soil Conservation District Office, or consult the telephone directory for engineering or marine contracting firms in your area. The Corps of Engineers and local office for building permits may also offer advice.

Protection measures which best provide for the conservation of fish and plant habitat, as well as shoreline stabilization, and have minimal encroachment into the channel are encouraged by the State of Maryland.

The suitability of an appropriate shore erosion control project for your property is based on several factors:

- 1) Landowner goals;
- 2) Amount of wave energy;
- 3) Slope of bank;



Photo: Team SWAMP, University of Maryland

## Types of Shoreline Stabilization Practices

### *NO ACTION.*

In some circumstances, the property will have only a very low erosion rate or experience erosion only during major storms. It may be desirable under these site characteristics to leave the shoreline in its natural condition.

*NON-STRUCTURAL* methods are those that recreate a natural system with natural materials. The selection of any of these methods requires careful planning, design, and construction considerations to withstand the erosive forces that may be encountered on your property.

*Beach nourishment* is the replacement of sand along the shoreline of an eroding beach. This method of control takes advantage of the natural protection that a beach provides against wave attack. Beach nourishment may also be used in combination with other methods of shore erosion control such as groin fields and breakwaters.



Photo: Team SWAMP, University of Maryland



Photo: MD Dept. of Natural Resources

*Slope grading and terracing* will reduce the steepness, and therefore, decrease erosion caused by waves striking a steep slope. However, this practice may also require careful management of vegetation on the slopes. There are typically restrictions on removing trees. Pruning of tree limbs may be an acceptable alternative to removing trees.

*Marsh creation.* Tidal marshes provide habitat for thousands of species of plants and animals. Many of these species, particularly fish, shellfish, and furbearing animals are of direct commercial and recreational importance. Marshes also provide natural shore erosion control, better water quality, and recreation and education opportunities. Planting a

marsh along an eroding shoreline, therefore, provides shore protection and many environmental benefits. A low offshore sill may provide additional protection for marshes and shorelines.

*STRUCTURAL erosion control practices* are divided into two broad groups according to their purpose; 1) those designed to stabilize a bank or fastland, and 2) those designed to stabilize a beach or promote accretion. Two basic types of structures are designed to stabilize a bank: filter structures (such as revetments) and wall structures. Filter structures reduce the level of the wave's strength while keeping soil from passing through to the water. Wall structures are impervious vertical walls that separate the natural shoreline from water and wave action.

*Revetments* are designed to reduce the energy of the incoming waves as they strike the surface of the structure, while at the same time, hold the soil beneath it in place. Reduction of the energy of incoming waves is accomplished by the sloping shape of the structure and by its rough surface. Filtering qualities result from the use of layers of varying sized stone and other materials.



Photo: MD Dept. of Natural Resources

*Jetties and Groins* are structures that interrupt the flow of sand for the purpose of widening an already existing beach and thus provide additional protection for the beach. Jetties are similar to groins but are much larger. Both of these structures are usually placed perpendicular to the shoreline, but they may be offset. They are not designed for the purpose of creating a beach.



Photo: MD Dept. of Natural Resources

*Breakwaters* are structures, made of various materials, placed offshore to reflect or decrease wave energy, creating a low energy zone, between the structure and the existing beach. Decreases in wave strength significantly affect the transport of sand by a wave. Sand moving along the shoreline maybe slowed or deposited on the beach side of the structure (Figure 14). The decrease in sand moving along the shoreline may cause increased erosion to adjacent properties. This erosion can be minimized by adding sand between the breakwater and the beach. Breakwaters may be used to protect selected areas of shoreline, headlands or harbors.



Photo: MD Dept. of Natural Resources

*Sand containment structures* are structures that interrupt the flow of sand for the purpose of creating and protecting a beach and/or marsh. Containment structures are placed perpendicular to the shoreline and help trap sediment to maintain the marsh. The channelward end of the structure should be at the approximate edge of the plantings at mean low water. Sand containment structures are similar to groins.



### Is More Information Available?

The guidance documents and fact sheets are available, free, from the Water Management Administration,  
Tidal Wetlands Division,  
1800 Washington Blvd., Baltimore, MD 21230 (410) 537-3837  
<http://bit.ly/1z6i7Xz>

- Shore Erosion Control Guidelines for Waterfront Property Owners
- Shoreline Stabilization How: to Select a Contractor
- Shoreline Stabilization: How to Select a Shoreline Stabilization Practice
- Shoreline Stabilization: Maintaining Your Shoreline Stabilization Practice
- Shoreline Stabilization: Marsh Creation
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