



Featured Product:



Product and Erosion Control Knowledge From:

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The Problem: Soil Erosion

Over many decades, hillside erosion and the erosion of shorelines around our lakes, rivers, streams and oceans has led to severely degraded waterways and aquatic ecosystems, loss of profitable agricultural land and decreased water quality. The natural vegetation that once held the soil in-place is being lost, impacted by increased residential development, urban expansion, farming practices, and increased human activities on lakes, rivers and streams. Normally, vegetation provides a natural filtration effect that mitigates the velocity at which sediment can be carried to bodies of water, thereby protecting shorelines from erosion. And without vegetation that natural filtration system becomes ineffective.

Absent of healthy shorelines, pollutants such as nitrates, phosphates and other soluble and particulate matter are often able to flow into bodies of water unrestricted, filling them with silt, particulate matter and chemical contaminants. In fact, sediment accounts for more than two-thirds of all pollutants entering U.S. waterways. Studies estimate that the U.S. is losing soil at a rate that is 10 times faster than the rate of natural replenishment.



The combination of nutrients and particulate matter loading results in increased algae growth, starving the water of oxygen and allowing invasive species to flourish. This leads to an unhealthy body of water that not only destroys naturally occurring aquatic ecosystems, but also disrupts recreation and other uses of these altered bodies of water.

The Cost of Erosion

Erosion has a number of detrimental effects on the land and our economy. As sediment is lost to the bodies of water, aquatic habitats are impacted; degrading the natural environment, including fish, native aquatic plants, birds and waterfowl. This also reduces popular recreational opportunities such as fishing and hunting. Additionally, arable land is reduced and water quality is affected. This has direct and measurable economic impact measuring in the tens of billions of dollars (USDA, 2002). As stewards of these sensitive environments, it is our obligation to protect and preserve them for each other and for future generations.

The Shoresox Story

Founder, Daniel Schaaf, knew the problem of erosion could be solved in an environmentally responsible way. His interest in finding natural methods to deal with shoreline erosion quickly became his passion. Thus, the development of Shoresox began.

The search for an effective and environmentally responsible solution to shoreline erosion included research and development activities completed in compliance and coordination with offices of the Department of Natural Resources, Watershed Districts and Land and Water Offices. Over an 11-year period, research, product development and field-testing took place, with one objective... Find natural, degradable materials and product configurations that would not only halt and reverse shoreline erosion, but would completely conform to the guidelines of state and local governing agencies.

Daniel was very interested in providing a product that could be filled with unused plant materials that are native to the area. Originally, the material used to fill Shoresox was cornstalks. What was once discarded and plowed into the earth could now be harvested, processed and sold. Continuing in that same spirit today, Shoresox is filled with locally-sourced agricultural products and organic materials.

Erosion Control Best Management Practices (BMPs)

The primary goal of an erosion control device is to immediately arrest sediment loss. When evaluating erosion control solutions there are a number of key factors to consider, including whether or not a given solution will support the long-term establishment of proper upland and aquatic vegetation. For millions of years, proper vegetation development has been nature's most effective solution for erosion control.

The erosion control industry promotes a set of generally-accepted guidelines and considerations based on these factors, called Best Management Practices or BMPs. Today, most governing agencies and municipalities have formalized BMPs that must be adhered to whenever conducting erosion management or restoration activities, or to mitigate the risk of erosion during construction or related activities.

While not all-encompassing, consider these typical erosion control BMPs (taken from a formal BMP manual):

- 1. Preserve existing vegetation.**
2. Divert upland run-off around exposed soil.
- 3. Seed/mulch/cover bare soil immediately.**
- 4. Use sediment barriers to trap soil in run-off.**
5. Protect slopes and channels from gullyng.
- 6. Install sediment traps and settling basins.**
- 7. Preserve vegetation near all waterways.**

Additionally, when considering bioengineered erosion control solutions:

8. The erosion control device must provide strength and integrity to support newly established vegetation.
9. The device must wick and retain water and nutrients to effectively support the health of newly established vegetation.
10. The device must provide safe ingress and egress zones for wildlife and aquatic life.
11. The device must contain appropriate organic material to provide safe and effective biodegradability, without causing additional contamination to nearby waterways.
12. The device must provide filtration of unwanted nutrients and pollutants in order to protect the water quality.

From a structural durability perspective, an important consideration is the mechanism by which the erosion control device is secured to the earth. Devices must have secure attachments, and should include means to apply or add tension to the system, as necessary, in the event the device settles. Devices that do not allow periodic re-tensioning may settle prematurely, causing newly developed roots and plants to tear or separate from the device.

Finally, during these challenging economic times, we must also seek to maximize the cost-effectiveness of available erosion control solutions. Following the practices mentioned above can provide beautiful environmental restoration, without costly replacement or maintenance.

The Shoresox Brand Advantage

Shoresox is an innovative, fully-degradable erosion control solution that arrests hillside and shoreline erosion immediately while providing a foundation for vegetative restoration. By comparison to competitive products, Shoresox contains a number of un-paralleled key design features and benefits.

Containment Unit Design

The patented Shoresox containment system is made from a combination of biodegradable burlap fabric and heavy-duty, photodegradable mesh. This combination provides excellent water-retention properties as well as outstanding durability. The full degradation period is greater than five years, allowing ample time for vegetation to develop strong and secure root systems.

Subsurface Anchoring System

The patented Shoresox sub-surface anchoring system securely attaches the containment unit **directly to the firm soil** of the intact shoreline or hillside. Competitive shoreline products are typically fastened to the less-stable, water-saturated shore bottom, subjecting the fastening system to the forces of wave action, wind and ice-heaving, potentially loosening and destabilizing the product.

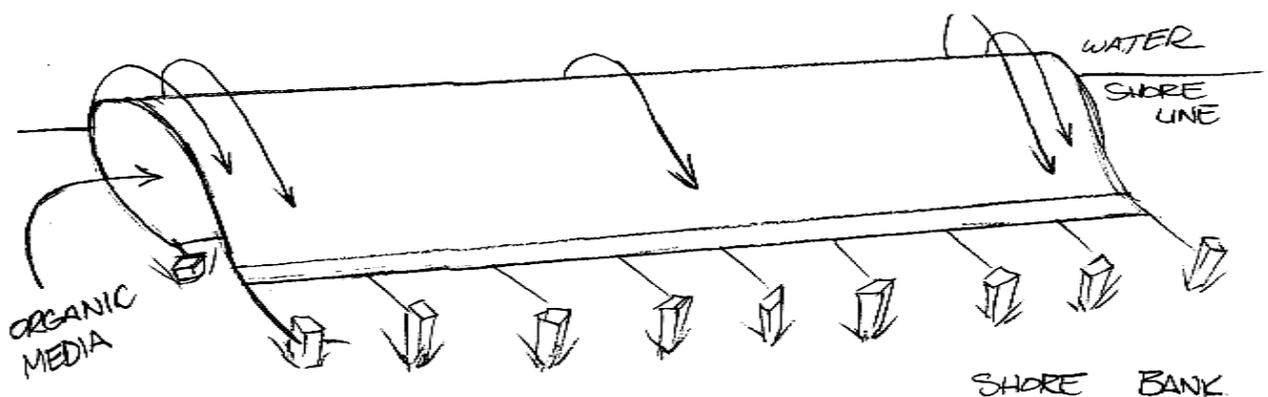
Safety

The patented sub-surface staking system used by Shoresox not only provides an exceptional means of securing the product to the earth, it also provides **unmatched safety** since there are no exposed stakes to pose a risk to humans and animals.

Ease-of-Use

Shoresox is simple to use and can be installed by almost anyone, without complex, destructive and costly equipment or machinery. Using common hand-tools, installation is completed as follows:

1. **Place** and partially secure the empty Shoresox containment system in its intended location.
2. **Fill** the containment system with locally-grown organic material.
3. **Roll** the Shoresox fabric over the organic filling to completely enclose the material.
4. **Secure** Shoresox to the firm soil of the shoreline or hillside using the patented anchoring system.



Shoresox Value

Value and Flexibility

Shoresox **maximizes overall value** by delivering a high-quality, flexible and cost-effective solution.

- A single Shoresox containment system provides the flexibility to cover an eroded area with a height ranging from just a few inches (~10 - 15 cm) up to approximately four feet (~1.2 m). Competitive products must be stacked in rows, or tiers, to achieve the same maximum level of coverage. Stacking multiplies the amount of product needed, leading to increased project cost.
- The cost of the Shoresox staking system is **included in our product pricing**, whereas many competitive products force you to purchase separate fastening systems to secure the product.
- The Shoresox containment system is shipped empty, providing **significant transportation savings** over our competitors. During installation, Shoresox is filled with locally-sourced organic materials. These organic materials may either be baled or loose, and either fresh or in a state of decomposition when used. Recommended filling materials include: oat straw, pine straw, barley straw, compactable (fertilizer-free) vegetation compost, etc.

Revegetation, Filtration and Buffering

Once filled and secured, native vegetation (upland and aquatic plants) can be planted through the mesh and fabric layers. And immediately after installation, Shoresox begins filtering and buffering run-off water, removing harmful contaminants and benefiting waterways and ecosystems. Shoresox can be used in conjunction with “hard-armoring” systems, such as stone rip-rapping, to provide this important advantage.

Shoresox is a modular system and is available in three different lengths, making it easy for customers to meet their projects’ unique design needs. All containment systems have a width of 54 inches, effectively providing up to 4 square feet of coverage per linear foot of product.

Length (Lin. Feet)	Weight ¹ (Pounds)	Ship. Wt. ² (Pounds)
25	10.1	30.3
50	20.3	53.7
100	40.6	107.3

¹ Approximate weight of one unfilled Shoresox containment system, not including staking system components.

² Approximate shipping weight of one complete Shoresox system. Each complete system includes one containment system plus the anchoring system for securing the containment system to the ground (stakes plus rope). Actual weight may vary. Organic filling material, installation tools are not included.

Product Patent: Shoresox

A copy of the patent can be found in Appendix A. The patent registration was filed in March, 2009, and granted in December, 2011. The major claims of the patent define the use of an open or bag system to protect shorelines or hillsides from erosion. The patent also protects the use of the unique rope and staking system developed by Daniel Schaaf. This patent is specific to the area of erosion control and broad in its scope of application in that area. US Patent No. 8,070,387 B2. Date of Patent: December 6, 2011.

Traditional Shoreline Erosion Control Products

More detailed understanding of the detrimental effects of soil erosion on our economy and ecosystems has spawned a vast market for erosion control products. The wide range of products spans across multiple levels of application, cost and effectiveness. The traditional products that most closely compete with Shoresox include coconut coir (fiber) logs, wattles, geotextile socks, stone rip-rap and stone gabion walls.

Curlex® Bloc: A product of the American Excelsior company, the Curlex® Bloc is constructed of a geotextile fabric bag pre-filled with aspen wood fibers. The unit is placed into position and staked into the shore bed using stakes and rope.

Curlex® Blocs are currently available in 4' and 8' lengths and weigh between 14 – 18 pounds per linear foot.



Coconut “Coir” Logs: Coir fiber, fashioned into logs or blocks, is used based on the theory that it helps native plants grow and stabilize stream banks, slopes, wetlands, and hillside soils for long term erosion control. These pre-filled units are placed into position and staked into the shore bed or hillside using stakes and ropes.

Coir logs are typically available in 10' – 20' lengths and weigh between 2 – 20 pounds per linear foot, depending on the density of the material.



Geotextile Socks: Socks (tubes) of geotextile fabric are filled with materials such as sediment, soil, natural fibers, etc. They are available in both pre-filled and un-filled variations. Once filled, the units are placed into position and staked into the shore bed or hillside using only stakes.

Geotextile socks are available in a variety of lengths, including long, continuous lengths, and typically weigh between 7 – 19 pounds per linear foot, depending on diameter and filling material.



Straw Wattles: Wattles are open-mesh tubes filled with straw or compost. They are similar in design to coir logs, although they are much lighter and degrade more quickly than coir. Wattles are most often used along the contours of newly constructed or disturbed slopes to provide sediment loss control.

Wattles are available in variety of lengths, including long, continuous lengths, and typically weigh between 1.5 – 2 pounds per linear foot.



Stone Rip-Rap: Stone is one of the common methods used in attempts to control erosion along lakes, rivers and oceans. Typically, a geotextile fabric is first laid along the shoreline and then covered with stones or boulders. Rip-rap installations are always custom-built, extremely labor-intensive, and most often necessitate the use of heavy equipment.



Stone Gabion Walls: Gabions are made by fashioning wire mesh “container” structures and then filling the containers with small to medium-sized stones. Many containers are usually necessary to complete a project. Stone gabion installations are always custom-built, extremely labor-intensive, and often necessitate the use of heavy equipment.



Competitive Landscape: Shoreline and Hillside Erosion Control Products

We at Shoresox find ourselves with a strong competitive advantage among erosion control solution providers. While a number of “traditional” erosion control products exist on the market, none of them are as uniquely-suited to meet the needs and challenges of erosion control installers. Simply put, Shoresox addresses virtually every drawback and challenge associated with using traditional products. Shoresox provides a safe, effective, durable, easy-to-use, visually appealing and cost-effective solution. Even in comparison to our closest competitors, the unique features and benefits of the Shoresox system remain unrivaled.

- Where heavy, traditional products necessitate the use of costly and destructive equipment during installation, Shoresox provides a light-weight, portable and easy-to-use solution. And because no heavy equipment is needed, there is no collateral damage to the surrounding landscape and environment.
- Where the semi-rigid, traditional products are challenged to follow the contours of the earth, Shoresox provides a fully-flexible solution, easily contouring around tight curves, trees and boulders.
- When the substantial weight of traditional products also means substantial transportation costs, the light-weight Shoresox system can be shipped for a fraction of the cost.
- Where multiple “tiers” of traditional products are needed to provide substantial vertical coverage (thereby multiplying project costs), Shoresox provides a solution with up to four square feet of coverage per linear foot of length.
- Where traditional anchoring systems (attached to the shore “bed”) can fail due to exposure to the physical forces of nature (wave action, ice-heaving, etc.), the patented Shoresox anchoring system is attached above the waterline, to the firm shore “bank,” easily resisting nature’s forces.
- Where the traditional anchoring systems utilize unsightly and dangerous exposed stakes, the Shoresox “subsurface” anchoring system is below-grade, and is Safe, Secure and Out-Of-Sight!
- While traditional products provide limited or no benefits for re-vegetation and run-off filtration, Shoresox has successfully, and repeatedly, demonstrated its ability to do both.
- Because Shoresox is shipped empty and filled with locally-sourced organic material, it supports the income stream for local farmers and eliminates the use of potentially invasive coconut coir fiber.

Not only does Shoresox beat traditional products in terms of safety, functionality, ease-of-use and durability, we also stack-up as one of the most value-packed products on the market. Shoresox is significantly less expensive than competitive products, especially when the comparison is based upon total available coverage.

Shoresox provides up to four square feet of coverage per linear foot of product. It takes two or three tiers of our competitors’ products to provide the same level of coverage. And because erosion control devices are sold by the linear foot, creating tiers multiplies the cost of the project.

Our pricing is also in stark contrast to the cost of other common “hard-armoring” solutions, such as rip-rapping. Typical rip-rapping installations cost \$75 - \$130 per linear foot, and obtaining rip-rapping installation permits from the DNR/DEP is become increasingly difficult. A number of other hard-armoring solutions are available, with some costing hundreds of dollars per linear foot. Considering all of the benefits of the Shoresox system, including our exceptional pricing, Shoresox provides the most value of any product on the market.

Shoresox vs. the Competition

The following table provides a straight-forward comparison between Shoresox and the closest competitive products. The comparison criteria reflect the important considerations and Best Management Practices associated with the erosion control industry.

Comparison Criteria	Shoresox	Curlex® Bloc	Coir Logs	Geotextile Sock	Stone Rip-Rap	Stone Gabion
Subsurface anchoring	Yes	No	No	No	N/A	N/A
Attaches to firm shore bank	Yes	No	No	No	No	No
Degradable	Yes	Yes	Yes	No	No	No
Supports re-vegetation	Yes	Yes	Maybe	Maybe	No	No
Filters & buffers run-off	Yes	Maybe	No	No	No	No
Lightweight construction	Yes	No	No	Maybe	No	No
Broad single unit coverage	Yes	No	No	No	Yes	Yes
Shipped empty	Yes	No	No	Maybe	No	No
Filled with local material	Yes	No	No	Maybe	Maybe	Maybe
Heavy equipment needed	No!	Yes	Yes	Yes	Yes	Yes
Resists forces of nature	Yes	No	No	No	Maybe	Maybe

Key Client Base

General Contractors: Any construction firms that are involved with significant earth work use erosion control systems during the construction phase. And if any amount of shoreline is impacted or involved, they will be required to restore the shoreline to an acceptable level so that natural vegetation re-growth is possible.

Environmental Contractors: These companies source materials to be used for shoreline restoration after a project is finished. These projects often can require thousands of feet of shoreline restoration.

Landscape Contractors: These contractors will be involved with shoreline projects when their clients have waterfront properties.

Golf Course Superintendents: Golf courses often have significant lengths of shoreline that are highly susceptible to erosion, particularly given the amount of water applied for turf maintenance. They are also keenly interested in maintaining shorelines that conform to the surrounding landscape and allow natural vegetation to guard against erosion.

Home Owners: Residential properties that have shorelines, in many cases, are devoid of buffer zones that help protect against erosion. Most watershed districts are now requiring increased efforts by shoreline property owners to mitigate erosion and make efforts to re-introduce native plants.

Before and After Shoresox Installation

