Living Shorelines Website
Final Report

To
Virginia Coastal Zone Management Program

Center for Coastal Resources Management
Virginia Institute of Marine Science

December 2010

This report serves as the final report for the Living Shorelines website revisions project funded by the Virginia Coastal Zone Management Program through NOAA. The project was task 94.04 Fy2009.

The Center for Coastal Resources Management (CCRM) has completed work on a new, revised, Living Shorelines website served through the CCRM subsite on the Virginia Institute of Marine Science website.

Feedback on our previous website was that it was a bit confusing in the navigation and lacked some of the information folks needed. To seek input on the format and content of the new site we conducted 3 focus group meetings of agencies folks, contractors, and representatives of non-governmental groups and the general public. Input from the focus groups was valuable to the final website design and content.

Changes from the original site are great in terms of the amount of information and the degree of detail. Most notable is the addition of detailed descriptions of various living shoreline options and accompanying photographs of actual projects over time. We also are serving a forum to enable interested parties to post and respond to questions regarding living shorelines.

The website was highlighted in a presentation at the CCRM/ VIMS biannual Wetlands Workshop on November 4th, 2010 attended by 80 people. We also distributed a brochure created and printed with previous VCZMP funding that advertises the concept of living shorelines and points people to the website for additional information.

The remaining content herein is the presentation made at the Nov.4 workshop.

The website is
http://ccrm.vims.edu/livingshorelines/index.html

This project was funded, in part, by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant #NA NA09NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended.

LIVING SHORELINES WEBSITE 2010

Karen Reay
November 2010

Preserving our coasts one shoreline at a time

Problem: Old LS Site Good But Needed Improvement

Center for Coastal Resources Management

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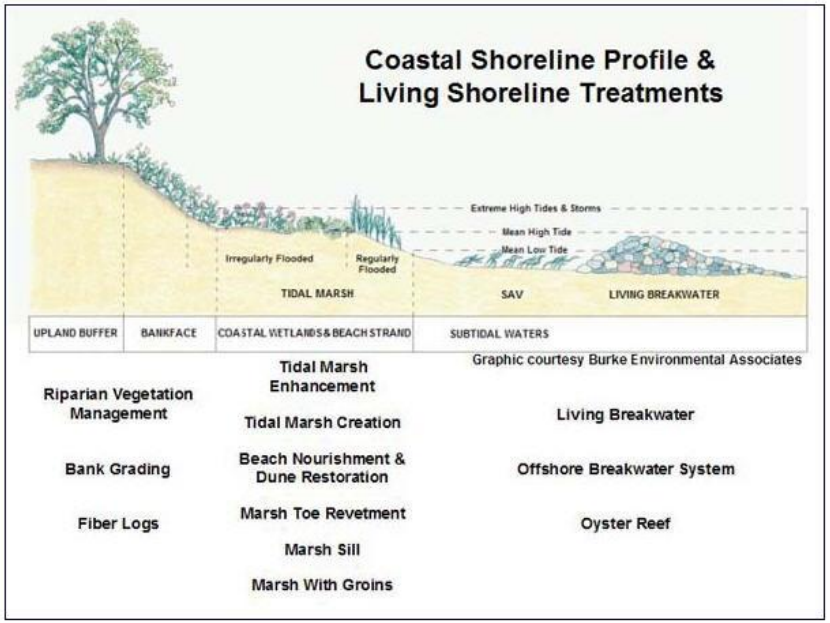
W&M > VIMS > CCRM > Living Shorelines

Living Shorelines

A "**Living Shoreline Treatment**" is a shoreline management practice that addresses erosion by providing for long-term protection, restoration or enhancement of vegetated shoreline habitats. This is accomplished through the strategic placement of plants, stone, sand fill and other structural and organic materials.

Living Shoreline Treatments do not include structures that sever natural processes & connections between riparian, intertidal and aquatic areas such as tidal exchange, sediment movement, plant community transitions & groundwater flow.



Steps in the Project

- Funding from Virginia Coastal Zone Management Program for:
  - 3 targeted user group meetings,
  - website revision, and
  - tri-fold brochure advertising the new Living Shorelines Website.

User Group Meetings

- January 2010 – 3 User Groups:
  - Business and Industry – Shoreline Marine Contractors
  - NGOs and Shoreline Property Owners
  - Regulatory - Coastal Managers

LS Website Development

- After consideration of comments from all user group meetings, modifications were made to the living shorelines website to improve functionality and ease of use

- Improvement classifications: revised site architecture, better navigational flow, improved links, new information, and more graphics/photos

Specific Modifications

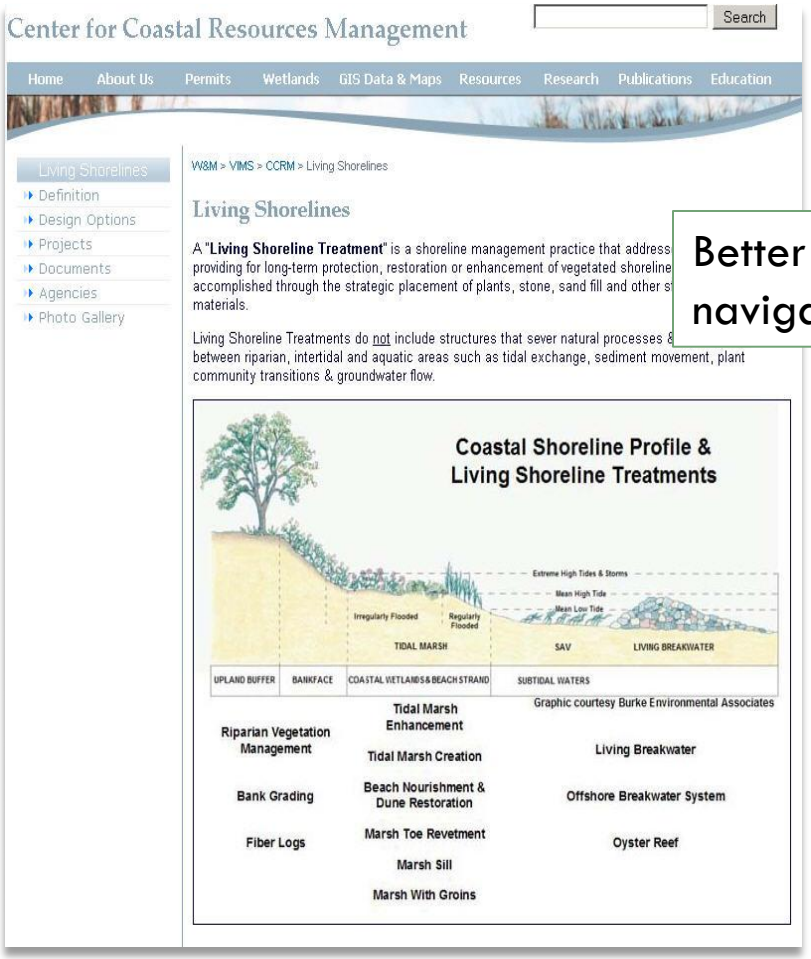
- **Better guidance for property owners** on the main page – directs right to the FAQ section with questions that drop to anchored answers or links to more information within the site.
- A **decision tree** that helps coastal property owners and managers determine the environmentally preferred approach to protecting currently undefended shorelines, given specific site conditions.
- An **extensive design and build criteria** for nonstructural and structural shoreline treatment options. **Nonstructural**: vegetation management, planted marsh, fiber logs, bank grading, beach nourishment and dune restoration. **Structural/Hybrid**: marsh toe revetment with natural marsh, marsh sill with planted marsh, offshore breakwater system, oyster reef. Each section includes information on suitable sites, guidelines for consideration, and photographic examples.
- A **permits section** related to living shorelines.

Specific Modifications 2

- **Upgraded LS plants and vendors –** individual plants by zonation with new page of native plants for beaches & sand dunes and improved shoreline planting suggestions and an updated list of plant vendors.
- **Learn about living shorelines** with link to VIMS teaching marsh.
- A **map** with living shoreline public demonstration projects including address, GPS location and contacts.
- **Expanded gallery** of before and after photos with a split screen and larger sized photos.
- A **FAQ** (frequently asked questions) page with answers, as well as links to additional information.
- A modified **publications, resources and contacts** page including a funding source and quick links to agencies & organizations, and articles & projects.

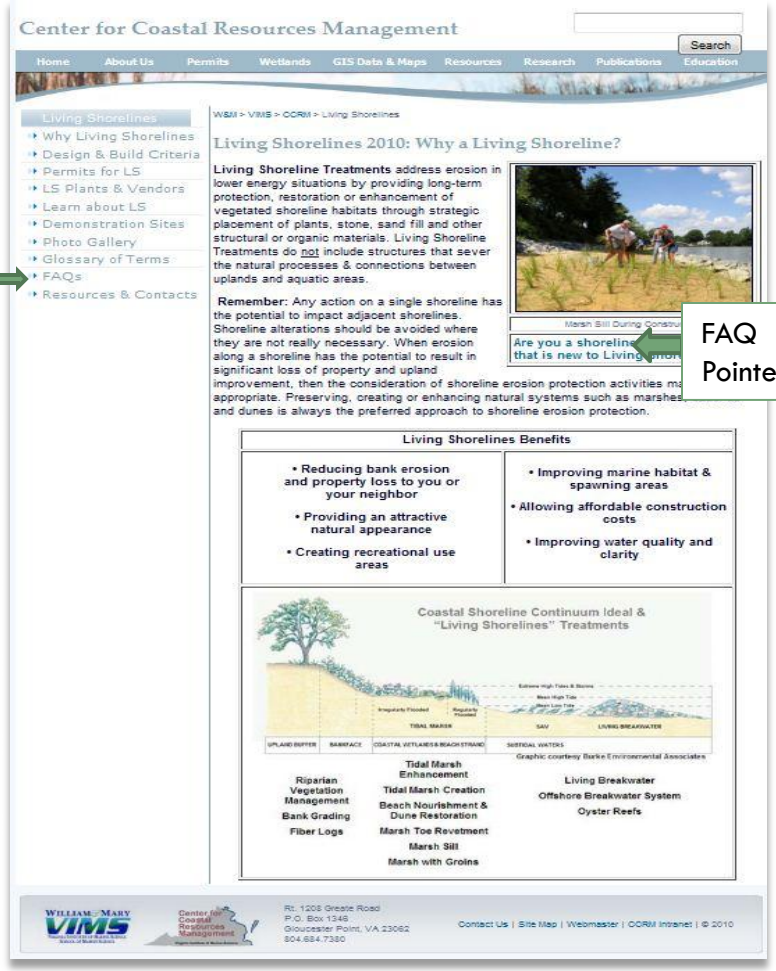
Living Shorelines 2010

Old Home Page



Better navigation

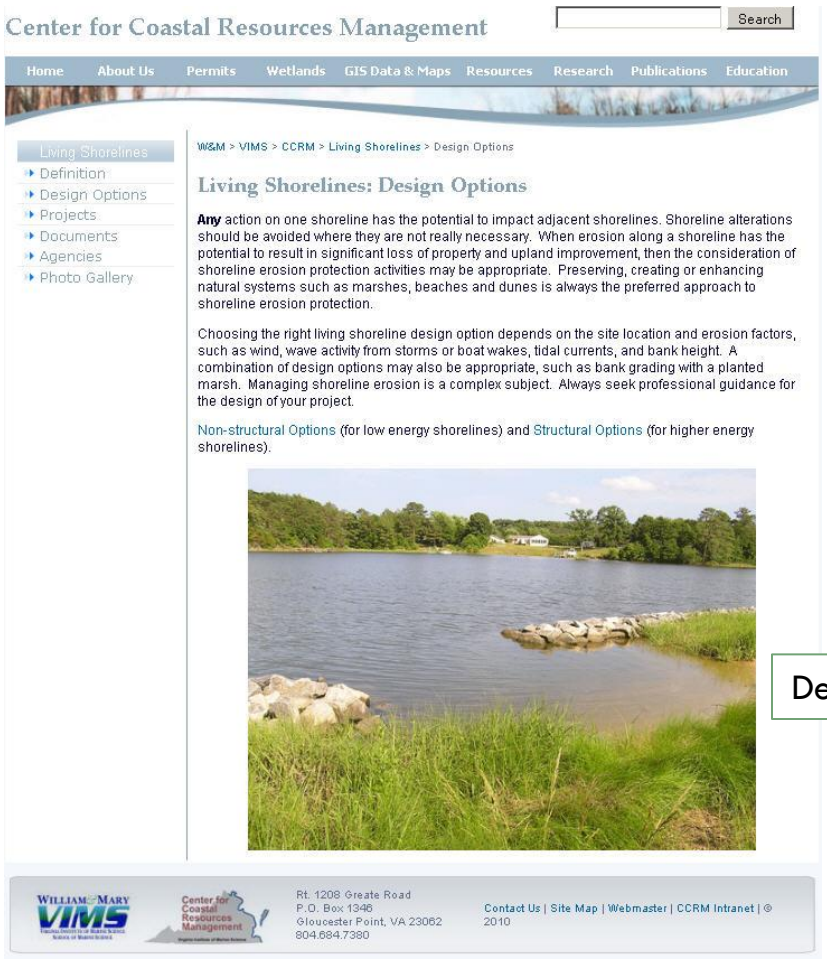
New Home Page



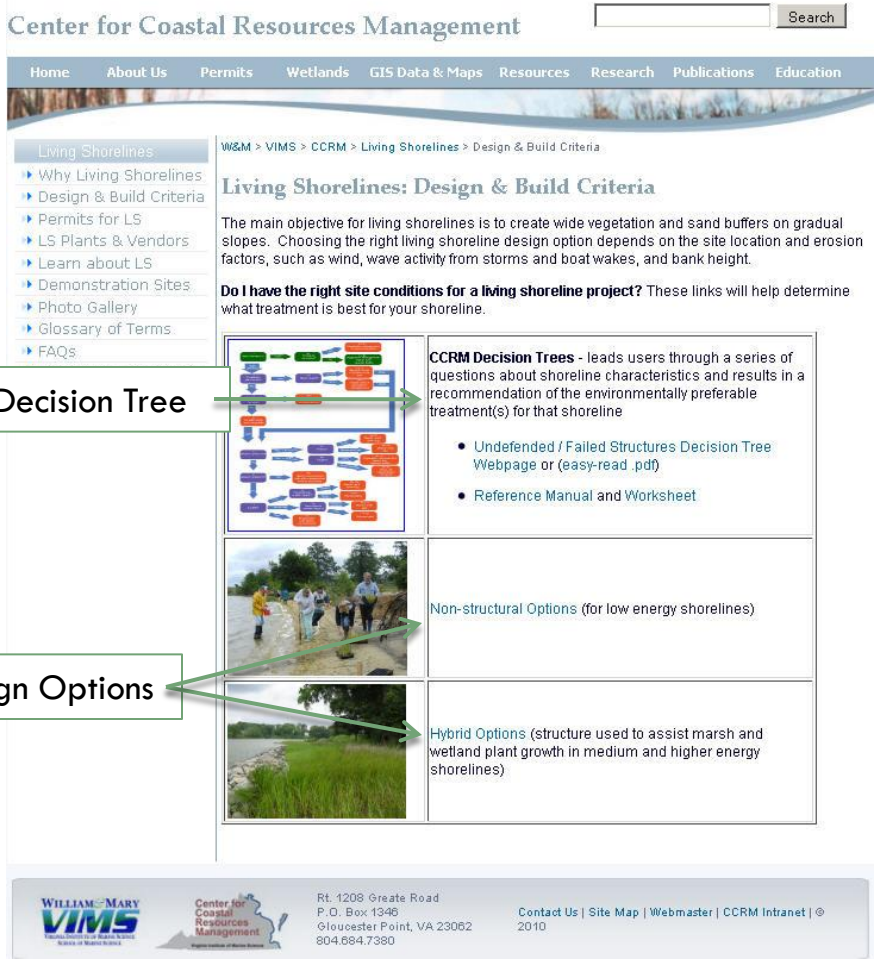
FAQ Pointer

Living Shorelines 2010

Old Design Options



New Design Options



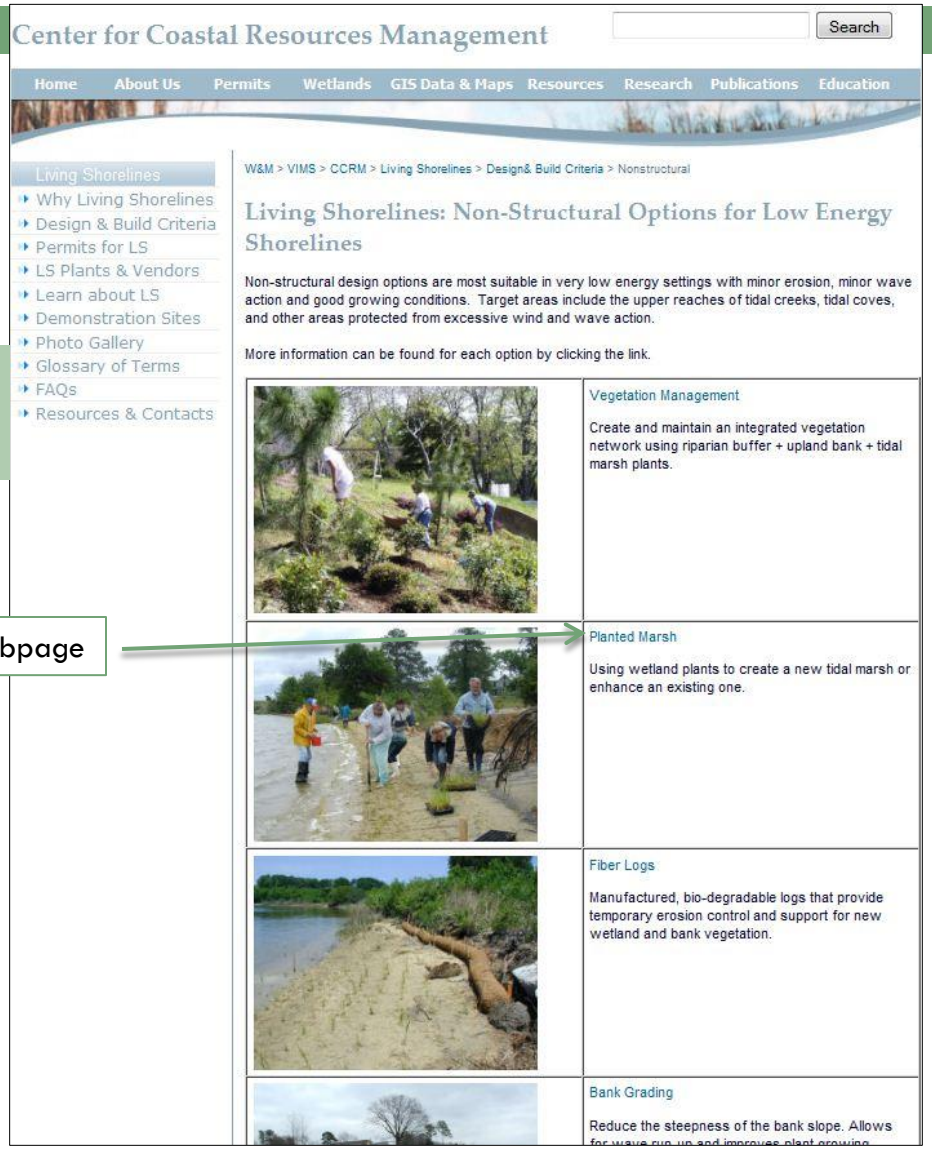
Decision Tree

Design Options

Within Design Options

First – Nonstructural Landing Page

Link to subpage



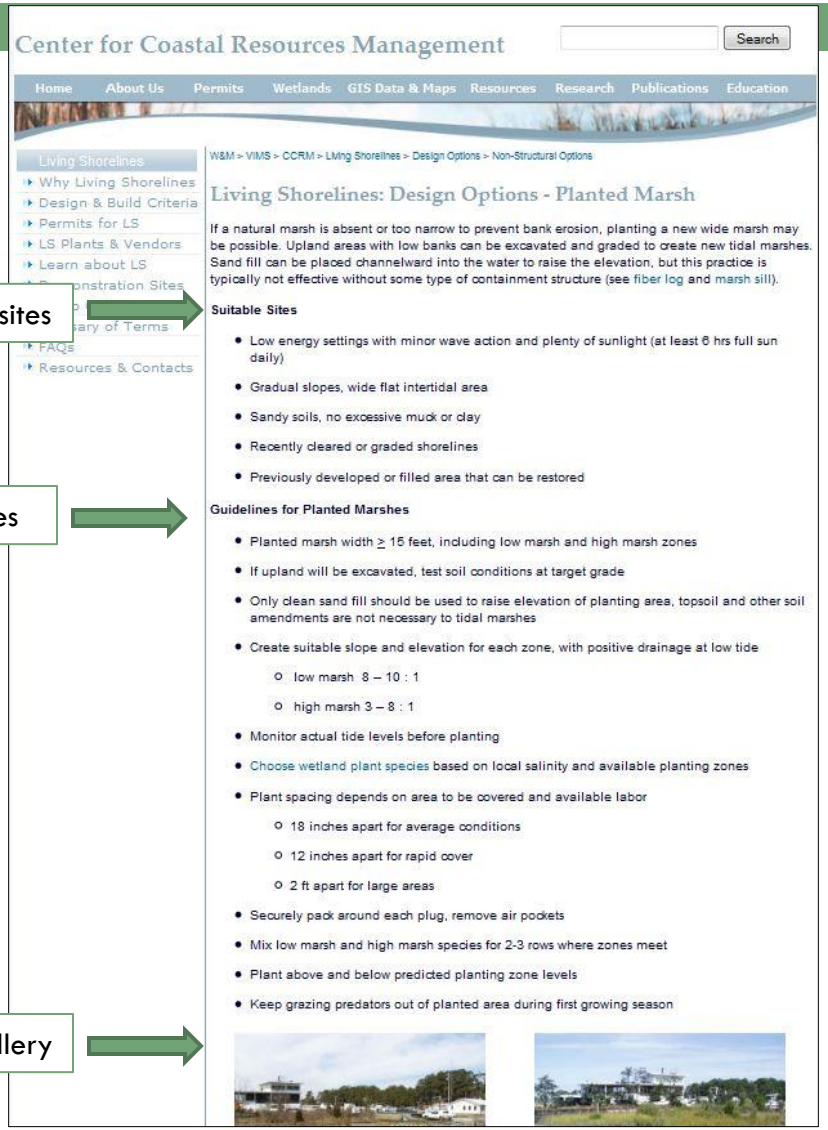
Within Design Options - Subpage

Second: Instructional Page – Planted Marsh

Suitable sites

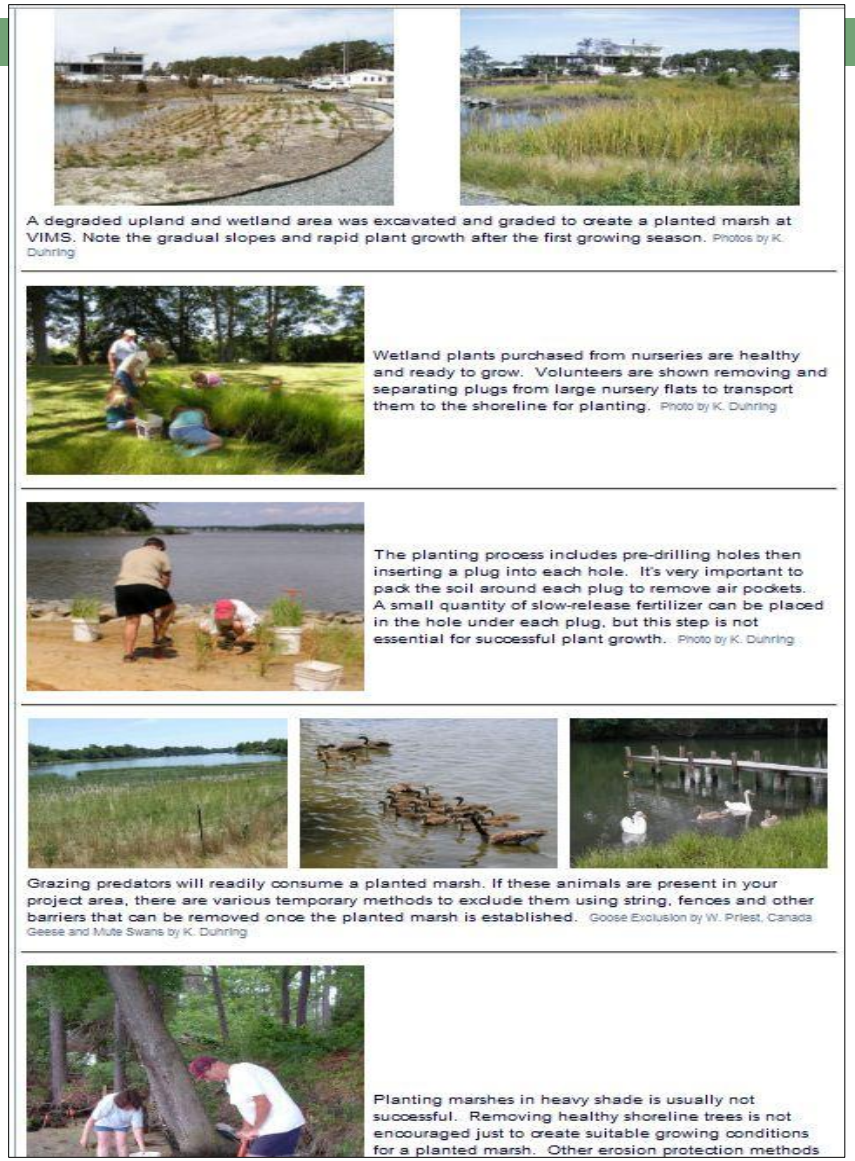
Guidelines

Example Gallery



Within Design Options (scrolled page)

Scroll Down of Planted Marsh Sub-Page with Informative Photos



A degraded upland and wetland area was excavated and graded to create a planted marsh at VIMS. Note the gradual slopes and rapid plant growth after the first growing season. Photos by K. Duhring

Wetland plants purchased from nurseries are healthy and ready to grow. Volunteers are shown removing and separating plugs from large nursery flats to transport them to the shoreline for planting. Photo by K. Duhring

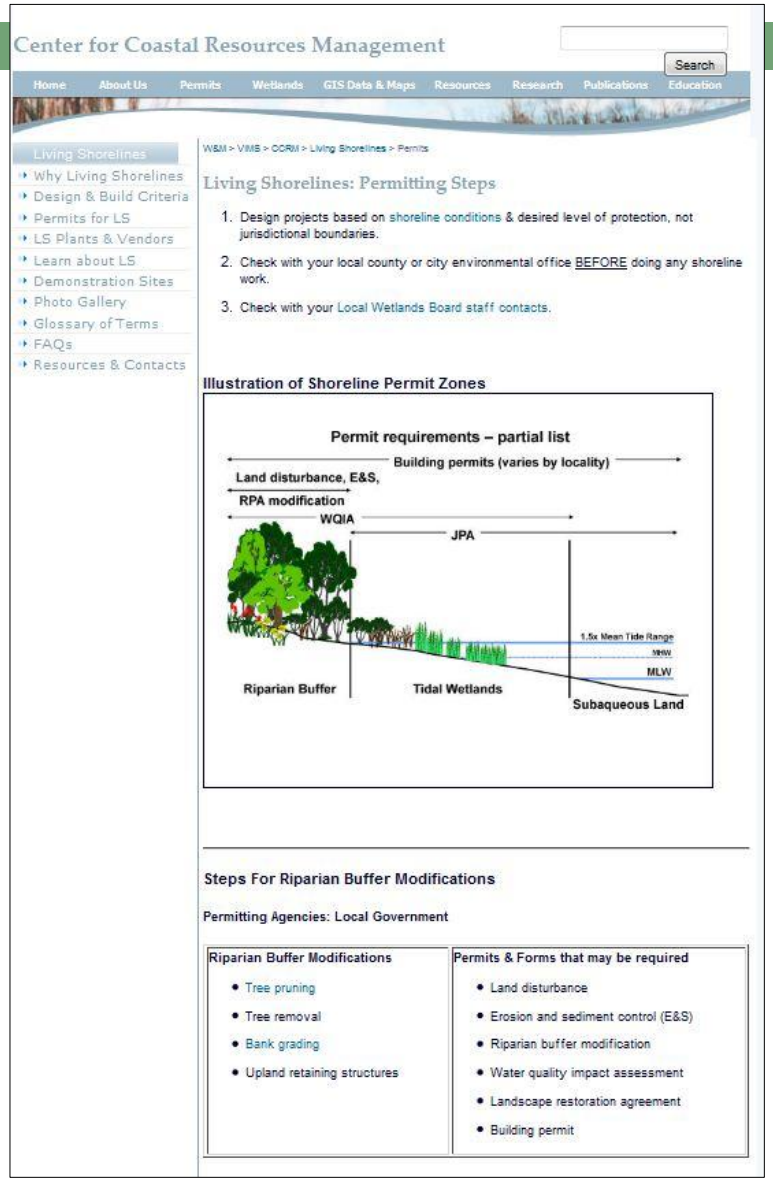
The planting process includes pre-drilling holes then inserting a plug into each hole. It's very important to pack the soil around each plug to remove air pockets. A small quantity of slow-release fertilizer can be placed in the hole under each plug, but this step is not essential for successful plant growth. Photo by K. Duhring

Grazing predators will readily consume a planted marsh. If these animals are present in your project area, there are various temporary methods to exclude them using string, fences and other barriers that can be removed once the planted marsh is established. Goose Exclusion by W. Priest, Canada Geese and Mute Swans by K. Duhring

Planting marshes in heavy shade is usually not successful. Removing healthy shoreline trees is not encouraged just to create suitable growing conditions for a planted marsh. Other erosion protection methods

New Permitting Page

Permitting page with specifics for living shorelines (local govt permitting agency for riparian buffer modifications and tidal wetlands and VMRC permitting agency for subaqueous modifications)



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- Photo Gallery
- Glossary of Terms
- FAQs
- Resources & Contacts

W&M > VIMS > CCRM > Living Shorelines > Permits

Living Shorelines: Permitting Steps

1. Design projects based on shoreline conditions & desired level of protection, not jurisdictional boundaries.
2. Check with your local county or city environmental office BEFORE doing any shoreline work.
3. Check with your Local Wetlands Board staff contacts.

Illustration of Shoreline Permit Zones

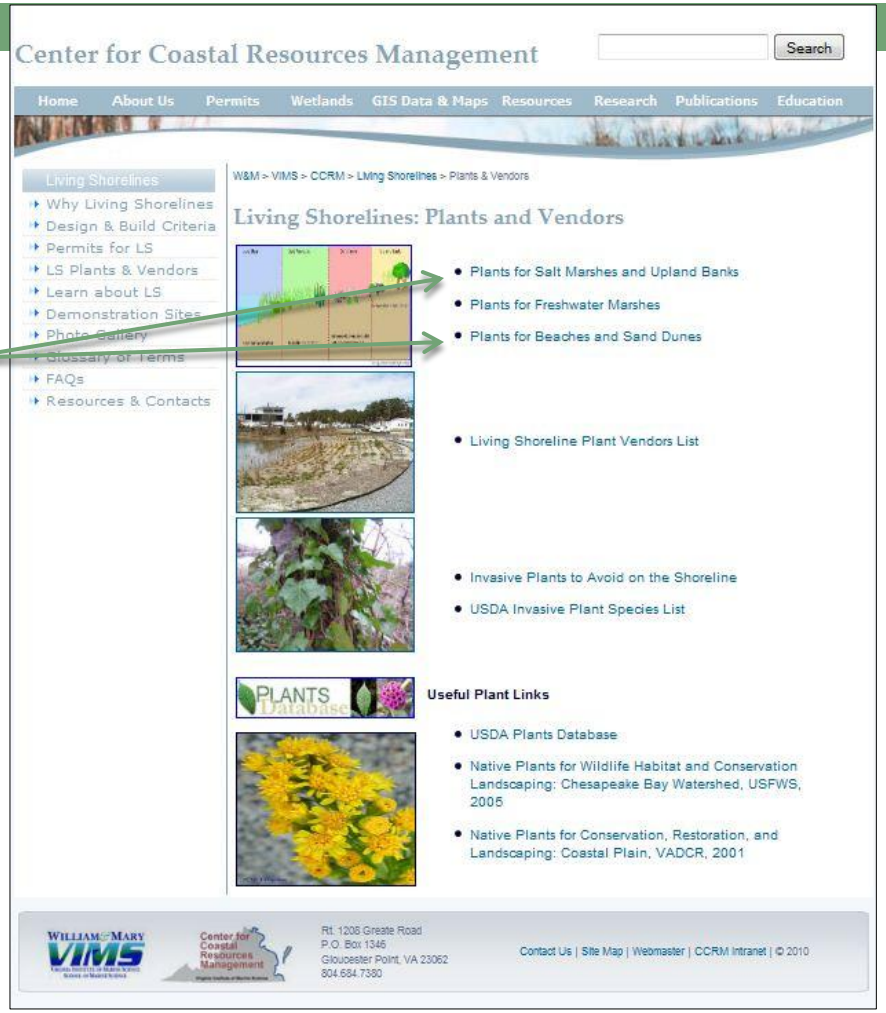
Steps For Riparian Buffer Modifications

Permitting Agencies: Local Government

Riparian Buffer Modifications	Permits & Forms that may be required
• Tree pruning	• Land disturbance
• Tree removal	• Erosion and sediment control (E&S)
• Bank grading	• Riparian buffer modification
• Upland retaining structures	• Water quality impact assessment
	• Landscape restoration agreement
	• Building permit

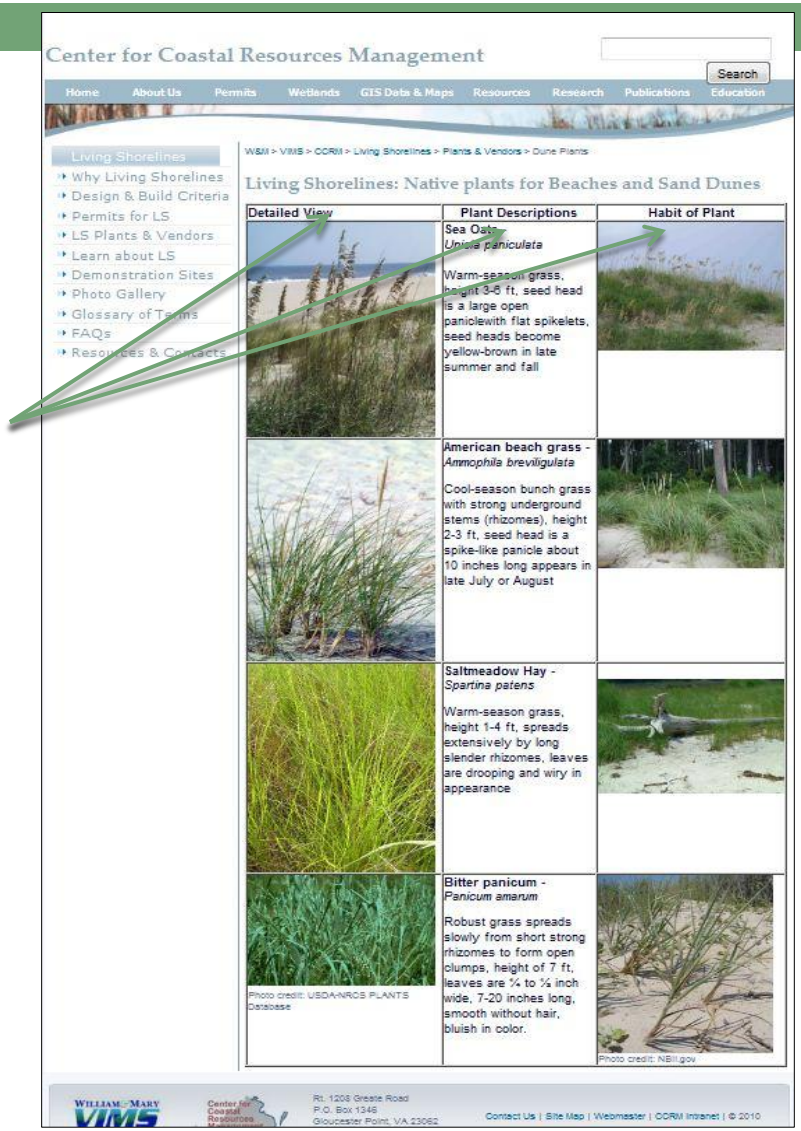
Updated Plants & Vendors

Updated with beach & dune plants and plants by zonation



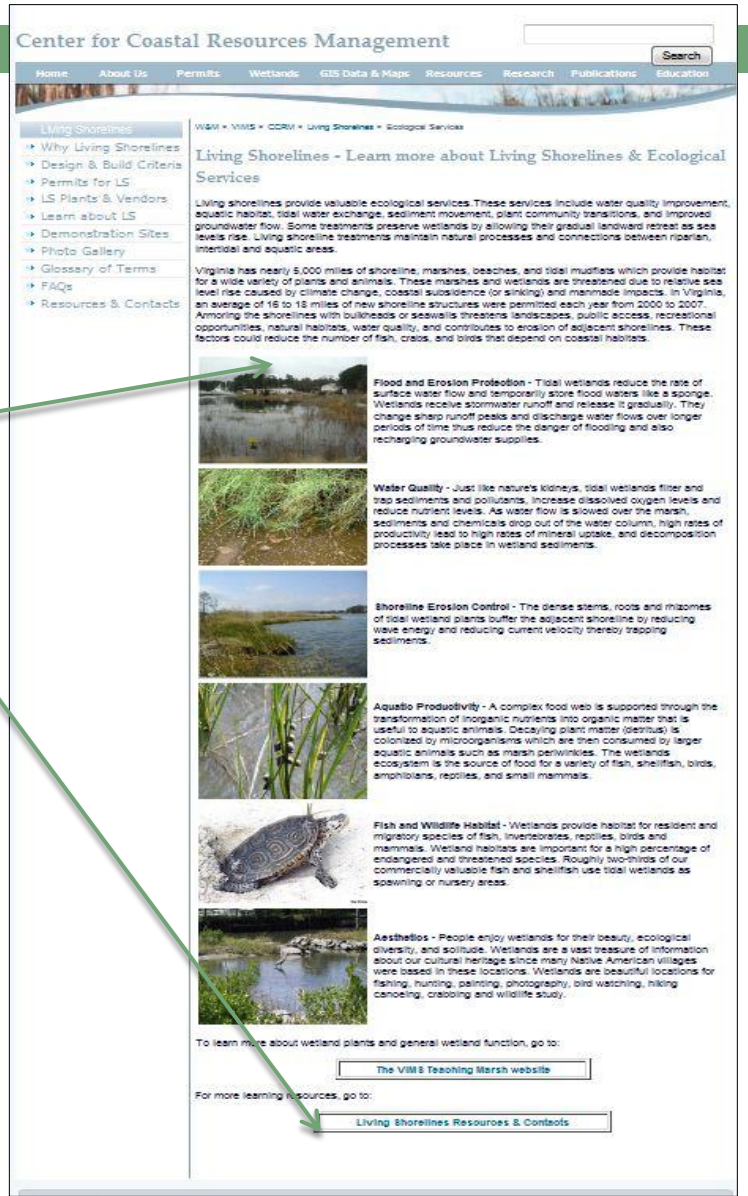
Updated Plants & Vendors - Subpage

Native plants for beaches and sand dunes with detailed view, description and plant habit



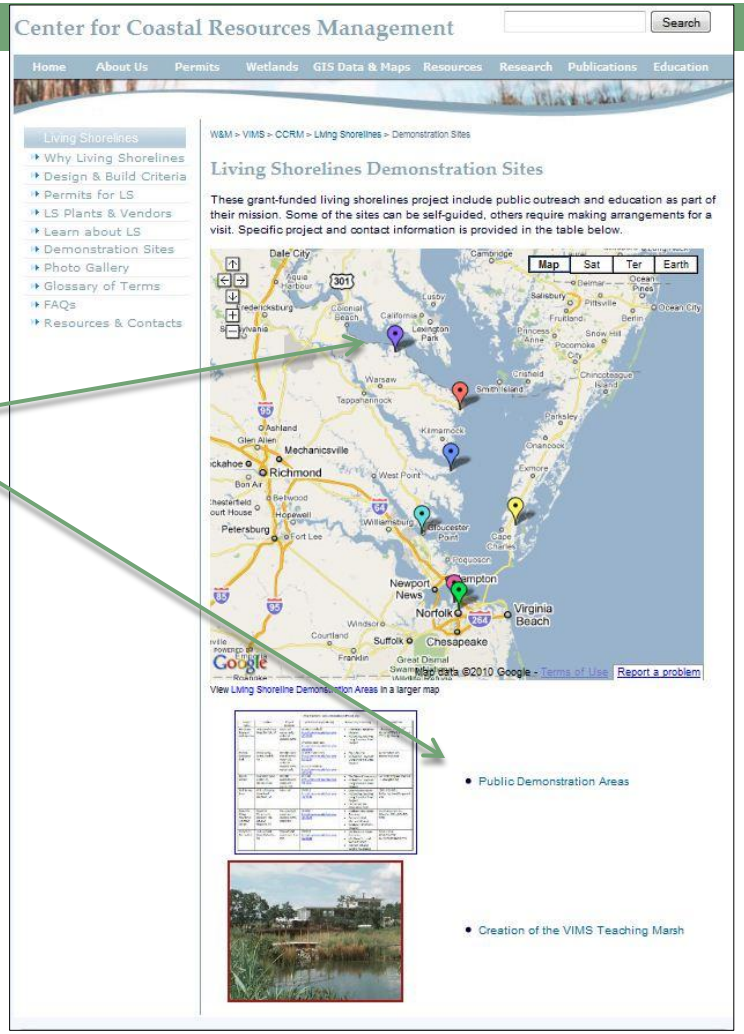
New Learn About Section

Discusses the ecological services of living shorelines and directs users to the VIMS Teaching Marsh subsite for more information



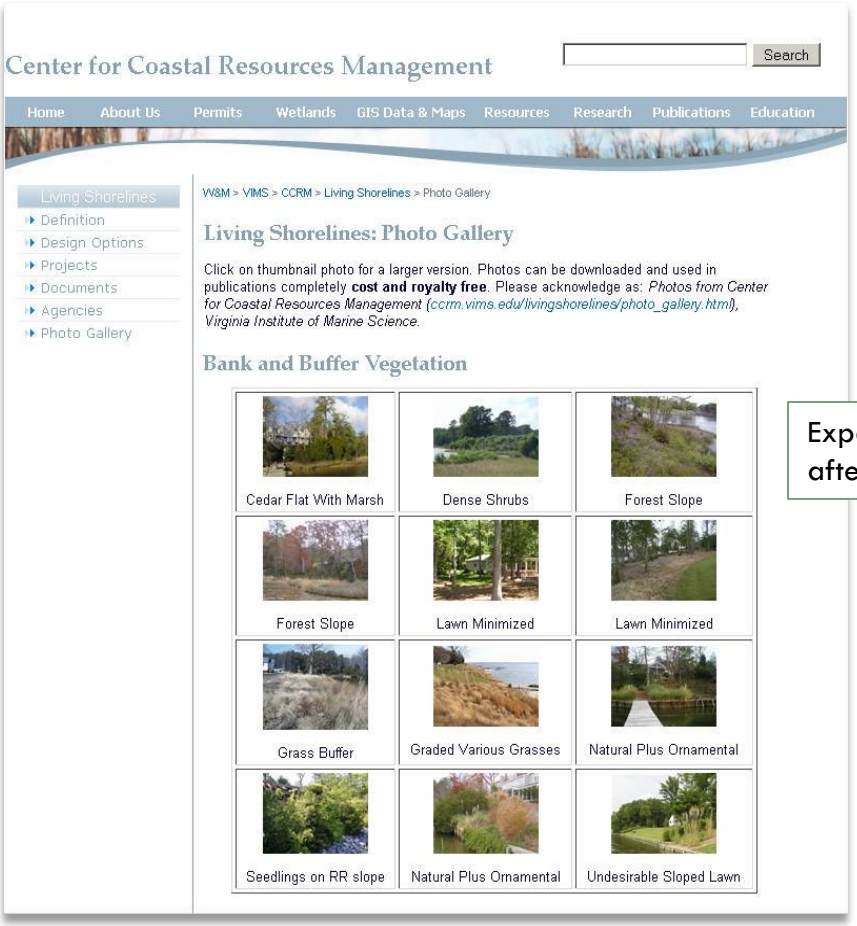
New Demonstration Area Maps

Google interactive map with target living shoreline demonstration areas and table of contact information



Living Shorelines 2010

Old Photo Gallery

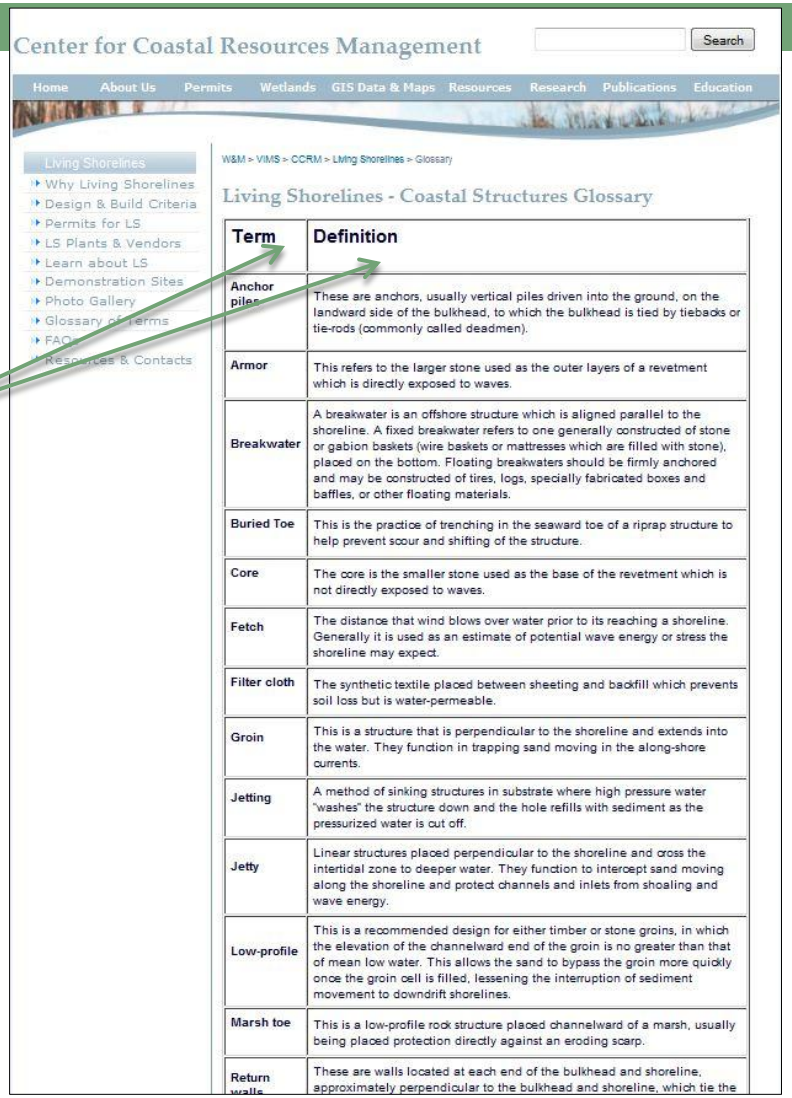


Expanded before & after sections

New Photo Gallery

New Glossary of Terms

Glossary of terms and definitions related to coastal structures



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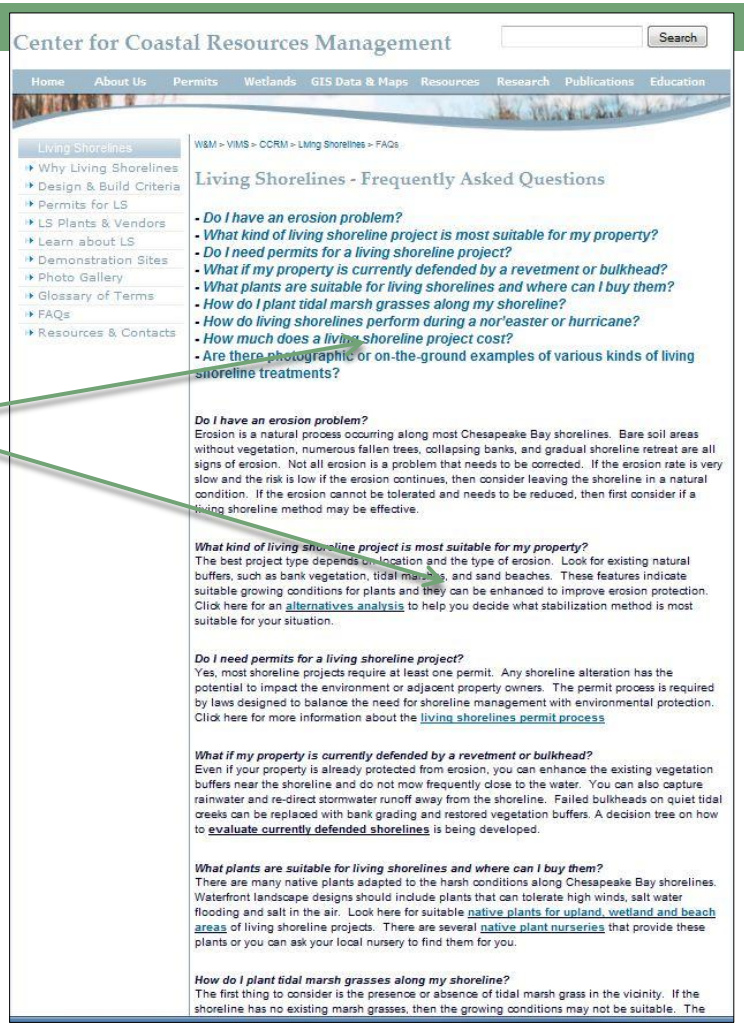
W&M > VIMS > CCRM > Living Shorelines > Glossary

Living Shorelines - Coastal Structures Glossary

Term	Definition
Anchor piles	These are anchors, usually vertical piles driven into the ground, on the landward side of the bulkhead, to which the bulkhead is tied by tiebacks or tie-rods (commonly called deadmen).
Armor	This refers to the larger stone used as the outer layers of a revetment which is directly exposed to waves.
Breakwater	A breakwater is an offshore structure which is aligned parallel to the shoreline. A fixed breakwater refers to one generally constructed of stone or gabion baskets (wire baskets or mattresses which are filled with stone), placed on the bottom. Floating breakwaters should be firmly anchored and may be constructed of tires, logs, specially fabricated boxes and baffles, or other floating materials.
Buried Toe	This is the practice of trenching in the seaward toe of a riprap structure to help prevent scour and shifting of the structure.
Core	The core is the smaller stone used as the base of the revetment which is not directly exposed to waves.
Fetch	The distance that wind blows over water prior to its reaching a shoreline. Generally it is used as an estimate of potential wave energy or stress the shoreline may expect.
Filter cloth	The synthetic textile placed between sheeting and backfill which prevents soil loss but is water-permeable.
Groin	This is a structure that is perpendicular to the shoreline and extends into the water. They function in trapping sand moving in the along-shore currents.
Jetting	A method of sinking structures in substrate where high pressure water "washes" the structure down and the hole refills with sediment as the pressurized water is cut off.
Jetty	Linear structures placed perpendicular to the shoreline and cross the intertidal zone to deeper water. They function to intercept sand moving along the shoreline and protect channels and inlets from shoaling and wave energy.
Low-profile	This is a recommended design for either timber or stone groins, in which the elevation of the channelward end of the groin is no greater than that of mean low water. This allows the sand to bypass the groin more quickly once the groin cell is filled, lessening the interruption of sediment movement to downdrift shorelines.
Marsh toe	This is a low-profile rock structure placed channelward of a marsh, usually being placed protection directly against an eroding scarp.
Return walls	These are walls located at each end of the bulkhead and shoreline, approximately perpendicular to the bulkhead and shoreline, which tie the

New Frequently Asked Questions

Question links at the top of the page jump the user to answers and links to more information.



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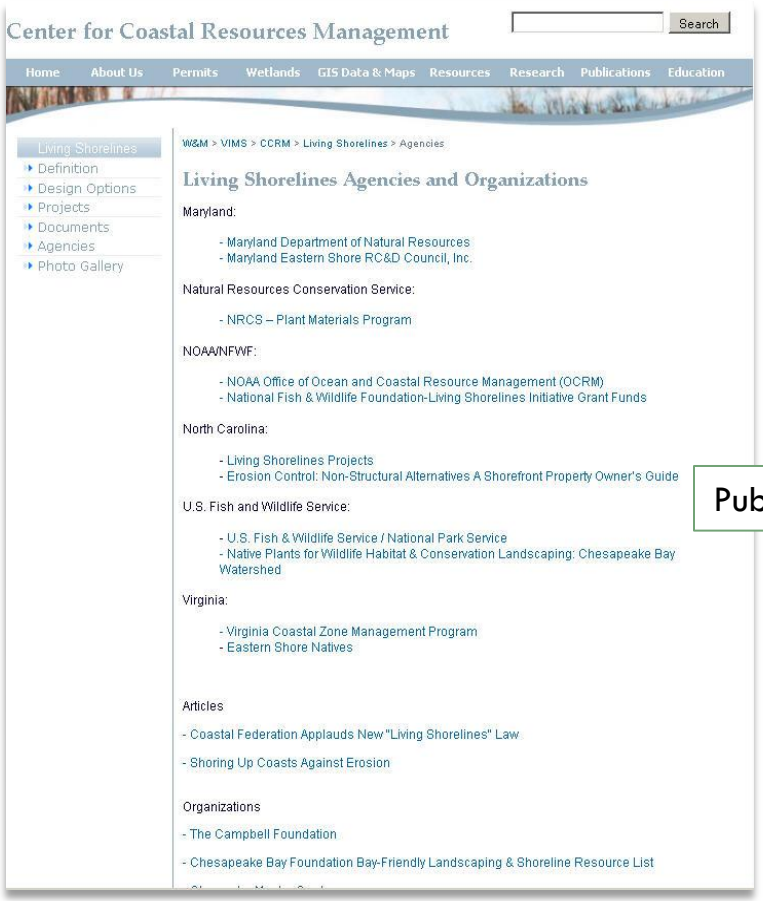
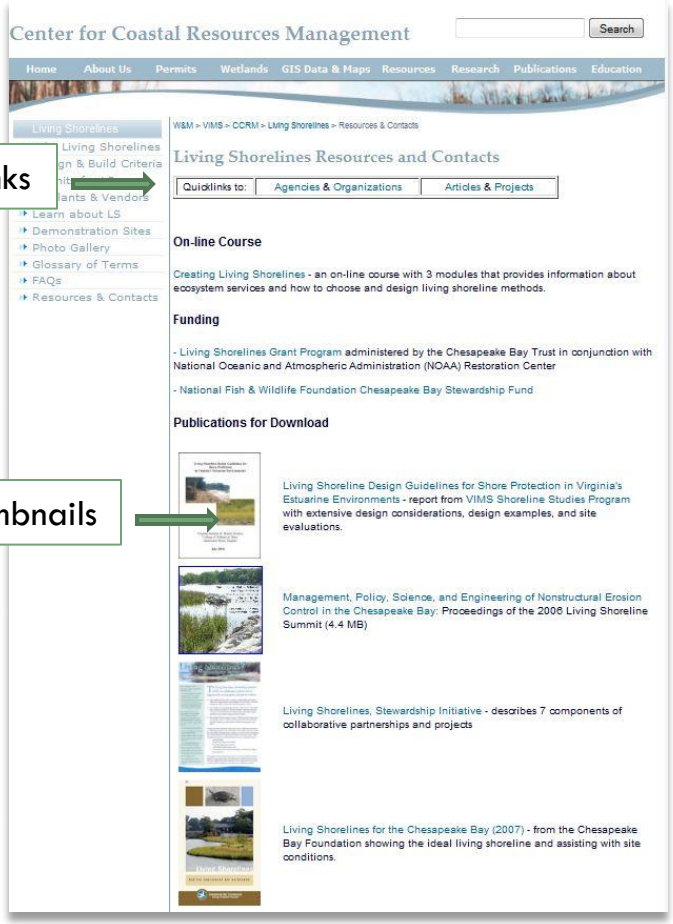
Old Agencies



New Resources and Contacts

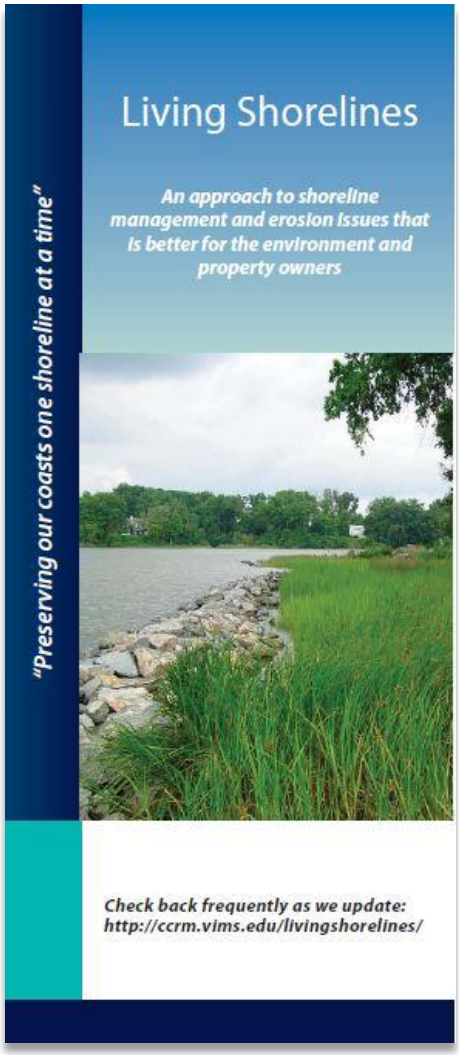
Quicklinks

Publication thumbnails



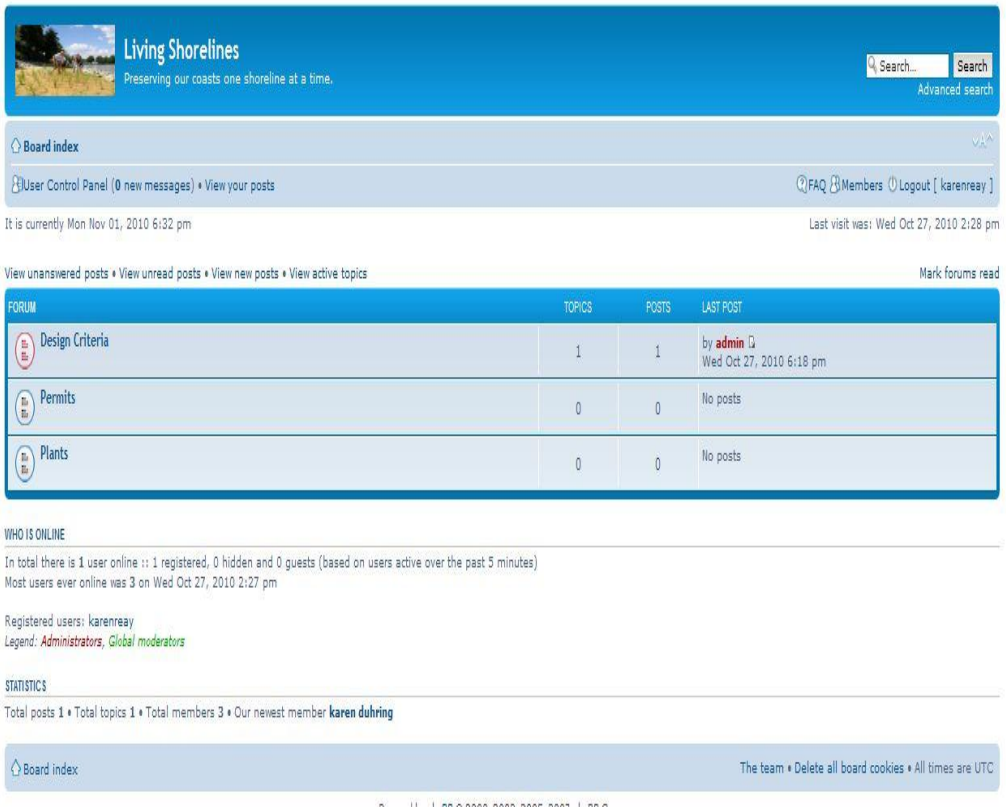
Outreach

Living Shorelines Brochure



Living Shorelines Forum

http://ccrm.vims.edu/livshlbb/index.php



What's in it for you?

- An **online resource** for shoreline property owners, permit applicants, and managers to obtain information or photos related to living shorelines
- Steering the public toward a shoreline management option that **improves ecological services** - marine habitat and spawning areas, improves water quality, reduces bank erosion and property loss, reduces marine debris due to storm damage, and provides a natural attractive appearance
- **An answer for coastal erosion** that preserves the connection of the water to the shoreline, marshes and wetlands

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HTTP://CCRM.VIMS.EDU/LIVINGSHORELINES

Preserving our coasts one shoreline at a time