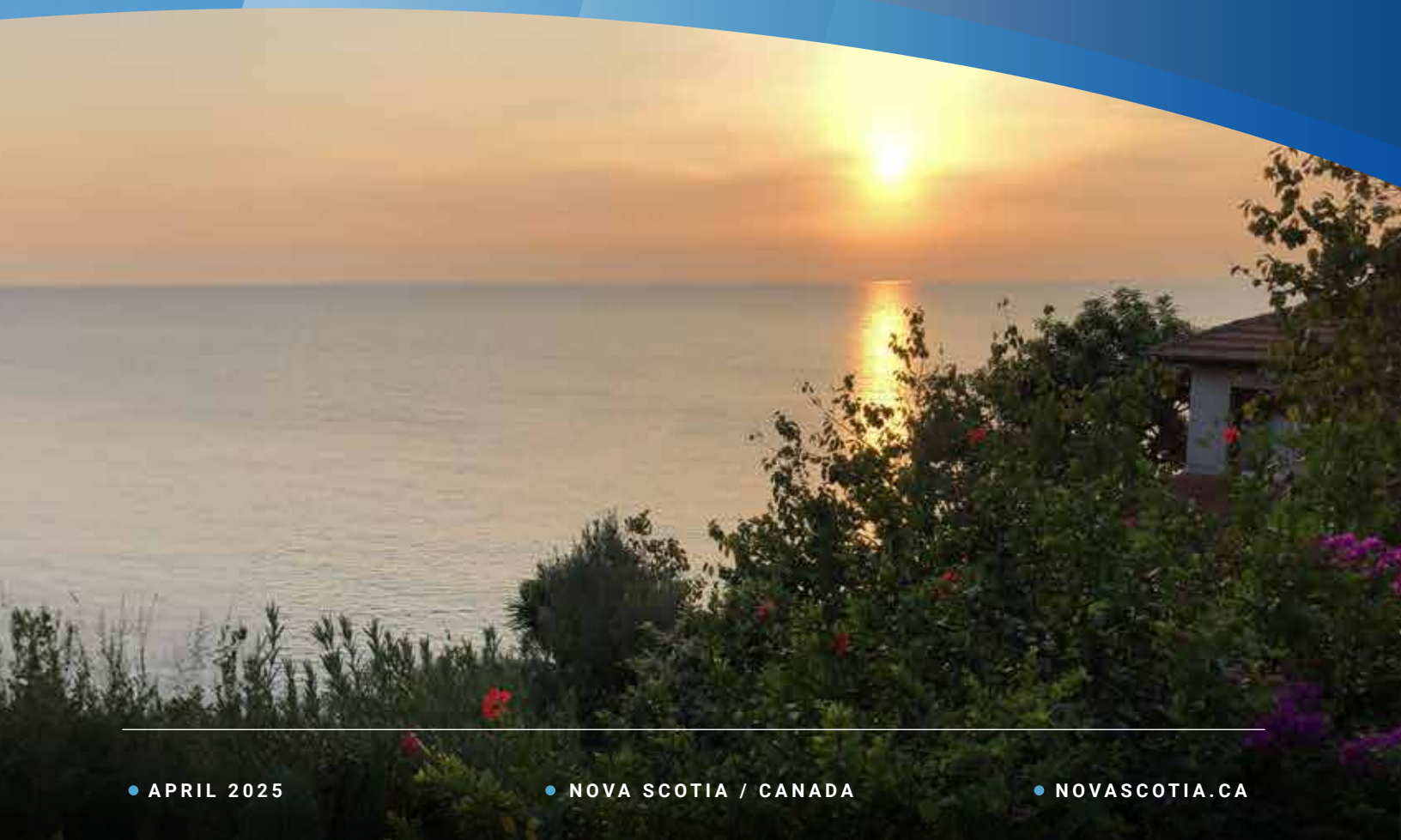


# NATURE-BASED SOLUTIONS FOR COASTAL PROPERTY OWNERS

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## Minister's Message

Nova Scotia's coastline is an important part of our Nova Scotia identity and way of life. We also know that our coastline is ever-changing, continuously being shaped by the ebb and flow of tides, waves, storms, wind, and the earth's changing climate. And the facts are clear – parts of our coast will look very different 25, 50, 100 years from now. Climbing global temperatures mean rising sea levels and more frequent and intense storms. Sea level rise - when combined with storm surge at high time - will intensify flooding and erosion in coastal regions in every corner of the world.

While nature shapes our coast, it can also protect it.

We have prepared this Nature-Based Solutions Guide to help coastal property owners learn more about how nature can protect your coastal property from erosion and flooding. Commonly referred to as nature-based solutions, this approach focuses on restoring, enhancing, or mimicking natural processes which can help reduce the impacts of coastal erosion and flooding.

The coast is an essential part of our shared identity as Nova Scotians. We have lived by our shores for generations. But we need to rethink how, and where, we live and build along our coast, especially as our province grows and as we face greater risks related to climate change.

If you live by the coast now or plan to one day, climate change can be concerning. Each of us can – and must – embrace a new approach to coastal living, one that considers our changing climate. It starts with information and tools that help us identify hazards and risks, and how to reduce or eliminate them.

I hope that you will find this guide – along with the other tools and resources available to help you protect your coastal property from erosion and flooding – beneficial.

**The Honourable Timothy Halman,  
Minister, Nova Scotia Environment and Climate Change**

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This guide provides introductory information for coastal property owners wanting to learn ways to work with nature to help protect Nova Scotia's coasts. What is right for your property will depend on local conditions and the unique features of your property. Professional contractors and other experts can help ensure you choose the best option for you. Always check with local authorities for any permits or regulations required before starting your project.

You can also contact our team of Navigators for help in using the Coastal Hazard Map and understanding your results. The Navigators can also help find additional resources on coastal hazards and potential options to address them. Contact the Navigators at [coastalnavigator@novascotia.ca](mailto:coastalnavigator@novascotia.ca) or **1-888-570-4240**.



## Introduction

Climate change is changing our environment. Climbing global temperatures means rising sea levels and more frequent and intense storms, leading to coastal flooding and erosion that can damage coastal properties.

There are a range of different options coastal property owners can use to help address these impacts. This guide provides an introduction to nature-based solutions for those looking to work with natural processes on their own property, above the ordinary high water mark.

Please note that while these nature-based solutions typically do not require a provincial permit for the solution itself, other permits may apply (e.g., if using a vehicle on the beach to deliver plant material or if Species at Risk live in the area).

The guide will help you:

- Understand nature-based solutions and their benefits.
- Identify key considerations before getting started.
- Determine what nature-based solutions to consider.

This guide is part of [The Future of Nova Scotia's Coastline: A Plan to Protect People, Homes and Nature from Climate Change](#), a suite of actions the Government of Nova Scotia is taking as part of its commitment to tackling climate change. Use this guide alongside other resources:

- [Safeguarding Your Property Guide](#) - This guide provides general advice and resources for coastal property owners to live safely near the coast.
- [Nova Scotia Coastal Hazard Map](#) – Allows you to visualize what sea level rise and storm surge could look like on your property at high tide.
- [CLIMAtlantic's Coastal Adaptation Toolkit](#) can help you identify options that might work for your property, including nature-based solutions.

For more information on the Government of Nova Scotia's actions to reduce greenhouse gases, increase renewable energy, protect more land and water, and grow the clean economy, please see [Our Climate, Our Future: Nova Scotia's Climate Change Plan for Clean Growth](#).

## What are Nature-Based Solutions?

**Nature-Based Solutions use nature to address problems.**

Every part of our coast is unique and constantly changing. That's why it is important to understand how nature works, and how to work with nature. Nature-based solutions focus on restoring, enhancing, or mimicking natural processes which can help reduce the impacts of coastal erosion and flooding.

As climate change continues, we can use nature to help protect vulnerable areas. Nature-based solutions can reduce the effects of erosion and flooding while keeping ecosystems healthy and working with the natural flow of water and sediment along the coast. This strengthens the long-term resilience and sustainability of coastal communities.

### **Examples of Nature-Based Solutions include:**

- Planting trees, shrubs, and grasses to restore natural shorelines and reduce the impact of storms.
- Using ponds and rain gardens to catch rain and slow runoff to the ocean, which reduces flood risk and erosion.
- Re-establishing native plants like wild roses and alders by establishing a "no mow" zone along the coast to stabilize the coast and slow erosion.
- Placing natural materials like brush or straw bales to slow erosion.

### **Nature-Based Solutions:**

- Usually they have lower maintenance and cost because they can recover from minor damage without expensive repairs.
- Create spaces rich in plant and animal life.
- Avoid disrupting natural processes, like the movement of sand and other materials along the shore, or causing disruptions in nearby areas.
- Help keep water clean, by creating waterfront buffer zones that trap sediments or soil before it reaches the ocean.
- Don't use as much heavy machinery that can compact soil and disturb wildlife habitat.
- Improve recreation sites with more plants.

**Nature-based solutions may not be suitable for all properties.  
Nature-based solutions are best suited in areas with low to moderate wave energy.**



## Before You Start

These steps can support you in planning, implementing, and maintaining nature-based solutions.

### Observe Your Property

Understanding your property's current condition is important. Coastal environments are constantly changing due to storms, tides, and seasonal cycles. Pay attention to changes over time. Regular monitoring allows you to track these changes and understand how your coastal property works. This information can help identify which nature-based solutions might work in this location.

- Start with the “Your Property Checklist” in the [Safeguarding Your Property](#) guide.
- Look for signs of sand or soil loss, pooling water, and changes over time, especially after storms or unusually high tides.
- Look for changes in plant health and gaps in coverage.
- Get to know the animals that live and move along your coast at different times of year.
- Talk with neighbours about what changes or impacts they've seen along the coastline.
- Look for [Species at Risk](#). A provincial permit is required if a provincially designated endangered or threatened species could be disturbed or interfered with during a project. You can find listed species and information on permits and approvals here: [https://novascotia.ca/natr/wildlife/biodiversity/permits\\_approvals.asp](https://novascotia.ca/natr/wildlife/biodiversity/permits_approvals.asp).



## Understand the Impacts

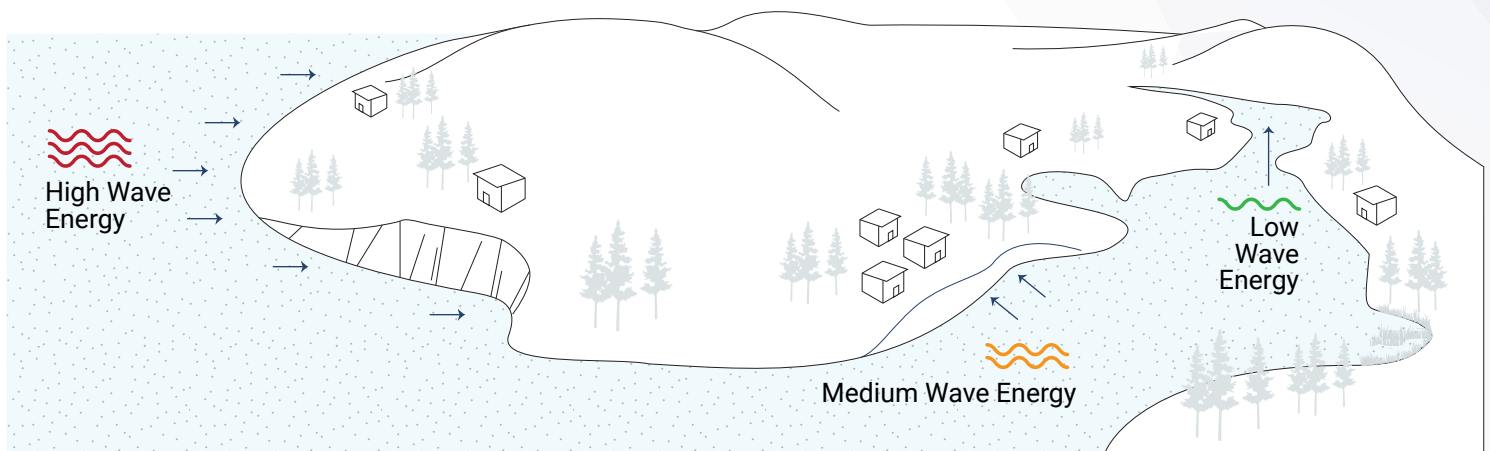
You may see different kinds of impacts from climate change, such as erosion, flooding, and permanent submersion. Some nature-based solutions are focused on addressing one problem, while others may address more than one.

**Submersion:** As sea levels rise, some coastal areas may become permanently underwater or submerged. This slow, but ongoing change can reduce land area and change the landscape.

**Storms and Coastal Flooding:** Coastal storms bring strong winds, heavy rain, and powerful waves that cause flooding and carry debris, potentially damaging buildings, roads, and other structures. Properties located in low-lying areas or close to the shore may be particularly vulnerable to storm impacts.

**Coastal Erosion:** Erosion is the loss of land and sediment, often worsened by storms and strong waves. Over time, erosion can reduce property size and expose buried infrastructure such as pipes, waterlines, and foundations, making buildings vulnerable to more damage.

**Wave Exposure:** Waves play an important role in coastal erosion. Wave exposure is the amount of energy a wave has when it hits the shorelines. This directly impacts how quickly the land may erode. The more exposed a property is to large and fast-moving waves, the higher the risk of erosion.



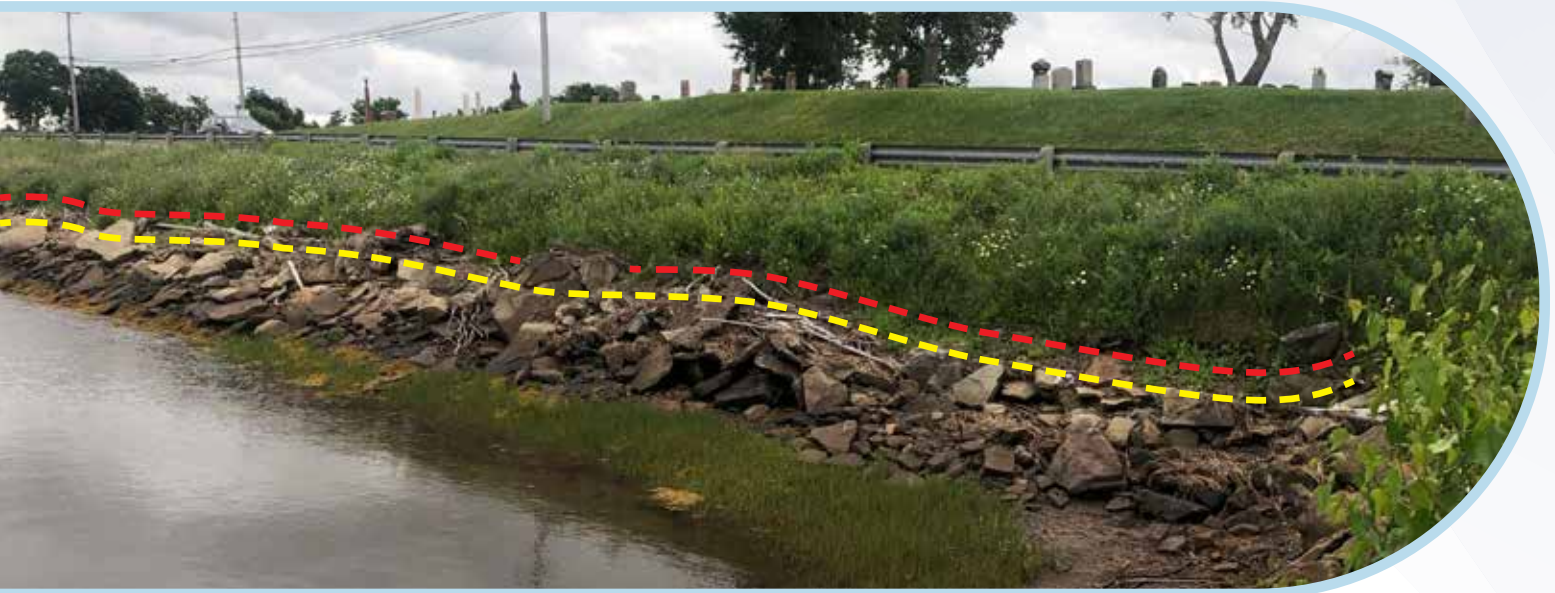
*Coastal exposure and high, medium, and low wave energy environments*

## Use Mapping Tools

The online [Nova Scotia Coastal Hazard Map](#) shows what sea level rise and storm surge could look like on every property at high tide, and what areas could be flooded. For more information on how to use the map and interpret its results, visit the [Coastal Hazard Map](#) and refer to the **User Guide** for step-by-step instructions.

Any work below the **ordinary high-water mark** will require permits and be more complex and expensive. If needed, consult a **Legal Land Surveyor** to verify the ordinary high-water mark on your property, as everywhere is different. It is important to confirm you are working above the ordinary high-water mark along the coastline or have the required permits to work below it before making changes to your property.

You can also contact our team of Navigators for help in using the Coastal Hazard Mapping Tool and understanding your results. You can contact the navigators at [coastalnavigator@novascotia.ca](mailto:coastalnavigator@novascotia.ca) or 1-888-570-4240.



■ Approximate High-Water Coastline (HWC)  
as per the Coastal Hazard Map

■ Approximate Ordinary High-Water Mark



## Use CLIMAtlantic's Coastal Adaptation Toolkit

This [online tool](#) is a free starting point that helps property owners understand their shoreline and provides guidance on selecting appropriate adaptation options for their specific property.

You will answer the questionnaire about your property and the impacts you see. The tool will suggest different options that can help your coast. This information is helpful to start conversations with professionals.

You can also contact the [CLIMAtlantic Help Desk](#) for help in completing and understanding the results from the coastal adaptation toolkit by phone at **1-506-710-2226** or through their [online form](#).



## Simple Solutions

Consider starting with simple options, which are often effective with low cost and effort. For example, when planning a new home or cottage, set your structure further back from the coast and give the shore room to move. Alternatively, creating a “no mow” zone (an area where you do not mow the grass) along the coast keeps soils healthy and creates a low-maintenance buffer zone for native plants to grow. Letting shoreline plants flourish can reduce erosion and storm impacts. Avoid directly crossing over dunes as this damages the natural vegetation and creates a path for water to flow. This can lead to more likelihood of dune failure during a strong storm.

## Seek Professional Support

Professional advice can help you find the right options for a property. For new buildings or renovations, this may be a planner, architect, landscape architect, builder, engineer, or contractor. For projects along the shore, a licensed professional engineer or similar expert can advise on ways to reduce impacts.

You can identify an appropriate professional through organizations such as:

- [Licensed Professional Planners Association of Nova Scotia](#)
- [Nova Scotia Association of Architects](#)
- [Atlantic Provinces Association of Landscape Architects](#)
- [Canadian Home Builders' Association Nova Scotia](#)
- [Association of Consulting Engineering Companies of Nova Scotia](#)
- [Geoscientists Nova Scotia](#)

## Identify Invasive Species and Species at Risk

Survey your property for invasive species and species at risk as these will inform what solutions are appropriate.

- To help identify invasive species, see the [Invasive Species of Nova Scotia: Identification and Information Guide](#).
- To help identify native species and species at risk, see the [Atlantic Coastal Plain Flora in Nova Scotia Identification & Information Guide](#).

## Work with Neighbours and Community Initiatives

Consider partnering with neighbours or joining local projects focused on nature-based solutions for coastal protection. Working together can pool resources, connect projects along the coast to create a larger protected area, and have more impact. Community initiatives often have access to additional funding and tools, making larger-scale efforts possible.



## Funding

You can contact the Climate Funding Navigator at [climatefundingnavigator@novascotia.ca](mailto:climatefundingnavigator@novascotia.ca) to learn about available funding supports.

Check out the [Funding Opportunities](#) page on the CLIMAtlantic website for a list of potential funding sources.

## Monitoring and Maintenance

You will need to regularly monitor any nature-based solutions you use on your property to understand what's working well, and what may need to be changed to be more effective. You will also need to maintain your project with watering, pruning, fertilizing, and occasional replanting as plants grow.

## Examples of Nature-Based Solutions

There is a diversity of nature-based solutions that you can use to help protect your property. Every part of the coast is different; something that works well in one area might not work as well in another. The best options for your property depend on the local conditions, environment, how severe or urgent the problem is, and the resources available. Any solution should be tailored to the specific conditions of the property.

The following examples of nature-based solutions are relatively inexpensive, require little or no professional guidance, and do not require permits so long as they are above the ordinary high-water mark.

These solutions share many similarities and focus on using vegetation and natural materials to slow water, reduce erosion, and encourage nature to take a lead role in shoreline protection. These solutions are best when used together.



## No Mow Zones

Changing how you mow the lawn along the coastal portion of your property is the simplest nature-based solution and can save you time and money. Identify a buffer of 10-30 metres around your shoreline and let nature take its course. By allowing native grasses and shrubs to grow, their deep roots help to hold soil together and stabilize slopes. For more information, please see the following guide: [Healthy Buffer Zone Guide \(Shediac Bay Watershed Association\)](#).

*No mow zone*



**Coastal hazard:** Erosion

**Cost:** Free

**Permits:** Not required

**Opportunities:** Can provide excellent, cost-effective protection against erosion and enhance habitat for wildlife. There is no need for permits or professional guidance. Some property owners may choose to trim some shrubs or branches to keep ocean views, while leaving the trees intact.

**Cautions:** Consider removing or managing invasive species before you allow these portions of your lawn to re-naturalize.

**Professional expertise needed:** No

**Maintenance:** Keep an eye out for invasive species



*Shoreline revegetation example*

## Re-Vegetation

Planting trees, shrubs, or other vegetation native to Nova Scotia is one of the easiest and most affordable ways to reduce erosion. Plants with deep roots help to hold soil together and stabilize slopes. Using a mix of native plants stabilizes the shoreline by linking different root structures. Vegetated banks can be reinforced with natural materials (e.g., mesh mats made of natural material), especially as plants are being established. Maintaining or adding native plants is a good idea on any site.

**Coastal hazard:** Erosion

**Cost:** Low

**Permits:** Typically not required when working above the ordinary high-water mark.

**Opportunities:** Can provide excellent, cost-effective protection against erosion, enhance habitat for wildlife, and improve property appearance. Planting trees or shrubs on your property above the ordinary high-water mark can often be done without the need for permits or professional guidance.

**Cautions:** Using vegetation to prevent erosion works best along shorelines that are relatively sheltered from strong winds and waves. Using vegetation not suited to your particular area may not be effective and could harm existing plants. Plants require time to grow and establish. Plan plantings for early spring to very early summer.

**Professional expertise needed:** Significant erosion issues are best assessed by a trained professional. A landscape architect or similar professional may be able to provide advice about plant selection and developing a planting plan.

**Maintenance:** Plants may need water and nutrients to establish and thrive. They will often regrow naturally if damaged, but replanting may occasionally be required.

## Soft Armouring

Soft armouring is an umbrella term that captures several different techniques which use natural materials to slow down water and protect exposed lands from erosion while feeding the soils with organic materials. There is often an overlap between these different techniques. Soft armouring solutions are often most effective when done in combination with other techniques (e.g., straw bales and brush matting) to protect newly planted trees and shrubs until they are well established.

### Straw Bales

Straw bale installation is a form of soft armouring that works well at the bottom of exposed slopes, and along exposed slopes to reduce erosion and trap sediment. Straw bales are a good short-term erosion protection measure.



*Straw bale soft armouring example*

**Coastal hazard:** Erosion

**Cost:** Low

**Permits:** Typically not required when working above the ordinary high-water mark.

**How:** Straw bales are installed at the toe of the slope, following the contour line of the slope, and firmly placed beside each other. They are secured with up to four wooden stakes per bale, two in the front and two in the back. They are then secured in place using jute or rope.

**Opportunities:** Can provide excellent, cost-effective protection against erosion, trap sediment behind them, and add organic material to the soil. Straw bales installation pairs well with planting trees and vegetation. Straw mats (thinner straw bales) are also useful to support newly planted vegetation, protect the newly placed soil, and allow the roots of the new plants to get established.

**Cautions:** Using natural materials to prevent erosion works best along shorelines that are relatively sheltered from strong winds and waves and have a low to medium slope. Use straw (dried grass) rather than hay (grass that has gone to seed) to avoid introducing non-native species to the site.

**Professional expertise needed:** Significant erosion issues are best assessed by a trained professional. A landscape architect or similar professional may be able to provide advice about slope and suitability for this type of soft armouring.

**Maintenance:** Straw bales will break down and need to be replaced over time.



## Mulching

Mulching is a common type of soft armouring that uses natural materials such as wood chips, leaves, and brush, to protect exposed soil from erosion. It is often used with new planting to retain water and add organic matter to the planting area. Mulch can reduce competition from weed species, reduce stormwater runoff volume and velocity, and improve infiltration rates ([State of California, 2019](#)). Mulching can also protect exposed soils from the freeze-thaw cycles during the early winter and spring, reducing frost heaving and erosion.

Mulching



**Coastal hazard:** Erosion

**Cost:** Low

**Permits:** Typically not required when working above the ordinary high-water mark.

**How:** Apply mulch in a layer 5-8 centimetres thick. Mulch is generally suitable on slopes that are not too steep.

**Opportunities:** Can provide excellent, cost-effective protection against erosion, trap sediment, and add organic material to the soil. Mulching helps retain water by reducing evaporation and increasing infiltration.

**Cautions:** Using natural materials to prevent erosion works best along shorelines that are relatively sheltered from strong winds and waves and have a low to medium slope. Use locally sourced materials from your property like leaves, wood chips, and brush. Applying too much mulch may limit native species from emerging.

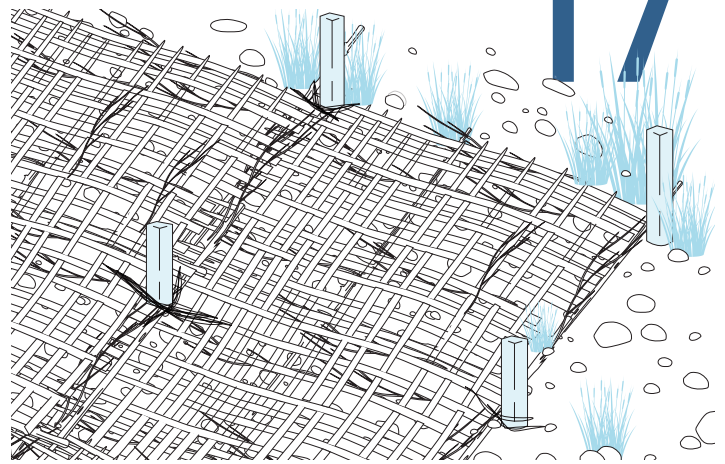
**Professional expertise needed:** Significant erosion issues are best assessed by a trained professional. A landscape architect or similar professional may be able to provide advice about using mulch on slopes greater than 2:1.

**Maintenance:** Re-mulch each spring or as needed.



## Brush Matting / Weaving

Brush matting or weaving is a soft armouring technique that creates a woven brush structure to protect exposed areas with little existing vegetation. These mats are flat woven mats that follow the slope on which they are planted. Plants like alder trees can be used to create a living structure that naturally regenerates.



*Brush mat design*

**Coastal hazard:** Erosion

**Cost:** Low

**Permits:** Typically not required when working above the ordinary high-water mark.

**How:** Wooden stakes (either ordinary wooden stakes or live cuttings) are installed every 0.6–0.9 metres (2-3 feet) to create rows along the edge of the exposed slope. A similar row of stakes is installed vertically up the exposed slope every 0.6–0.9 metres (2-3 feet) depending on the slope and length of brush being used. This will form a grid pattern. Brush is then woven in between the stakes to create a woven mat or structure. Then, more brush is used to weave together the rows of brush moving up the slope. This technique can use stakes from conifer or deciduous trees. Stakes made of live cuttings from species such as willow and dogwood may be integrated into the weaving to encourage revegetation.

**Opportunities:** Can provide excellent, cost-effective protection against erosion, enhance habitat for wildlife, and help revegetate slopes. These techniques can use waste materials that would otherwise be collected as yard waste.

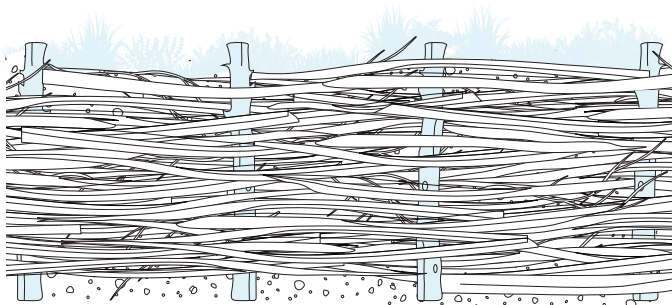
**Cautions:** Using natural materials to prevent erosion works best along shorelines that are relatively sheltered from strong winds and waves and have a low to medium slope. Using the wrong type of soft armouring may not be effective and could harm existing plants. These techniques can be physically demanding and require a reliable source of organic materials. If using live stakes, plant in spring or early summer.

**Professional expertise needed:** Significant erosion issues are best assessed by a trained professional. A landscape architect or similar professional may be able to provide advice about plant selection, develop a planting plan, and provide insight around slope and suitability for this type of soft armouring.

**Maintenance:** If using live stakes, plants will need water and nutrients to establish and thrive. Live stakes may need to be replaced if they do not establish.

## Fencing (Wattle Fencing and Living Fences)

*Living fence design*



Wattle fencing and living fencing techniques are nature-based solutions that are used to reduce erosion and trap sediment. The fences are vertical structures, roughly 0.3–0.6 metres high (1–2 feet), that follow the natural contours of the land. Using living willow or dogwood stakes in the construction of the fence can help revegetate the site and create a living structure that will grow over time.

**Coastal hazard:** Erosion

**Cost:** Low

**Permits:** Typically not required when working above the ordinary high-water mark.

**How:** Install stakes at 0.6–0.9 metre (approximately 2-3 feet) intervals depending on brush length, along the contour. Select brush that is long enough to span at least three stakes and weave the branches on the inside and outside of the stakes. Continue weaving one branch at a time until you have reached the end of the stakes. Repeat until you have reached the desired fence height. Push the weaved branches down between layers to reduce any large gaps.

**Opportunities:** Can provide excellent, cost-effective protection against erosion, enhance habitat for wildlife, and improve property appearance.

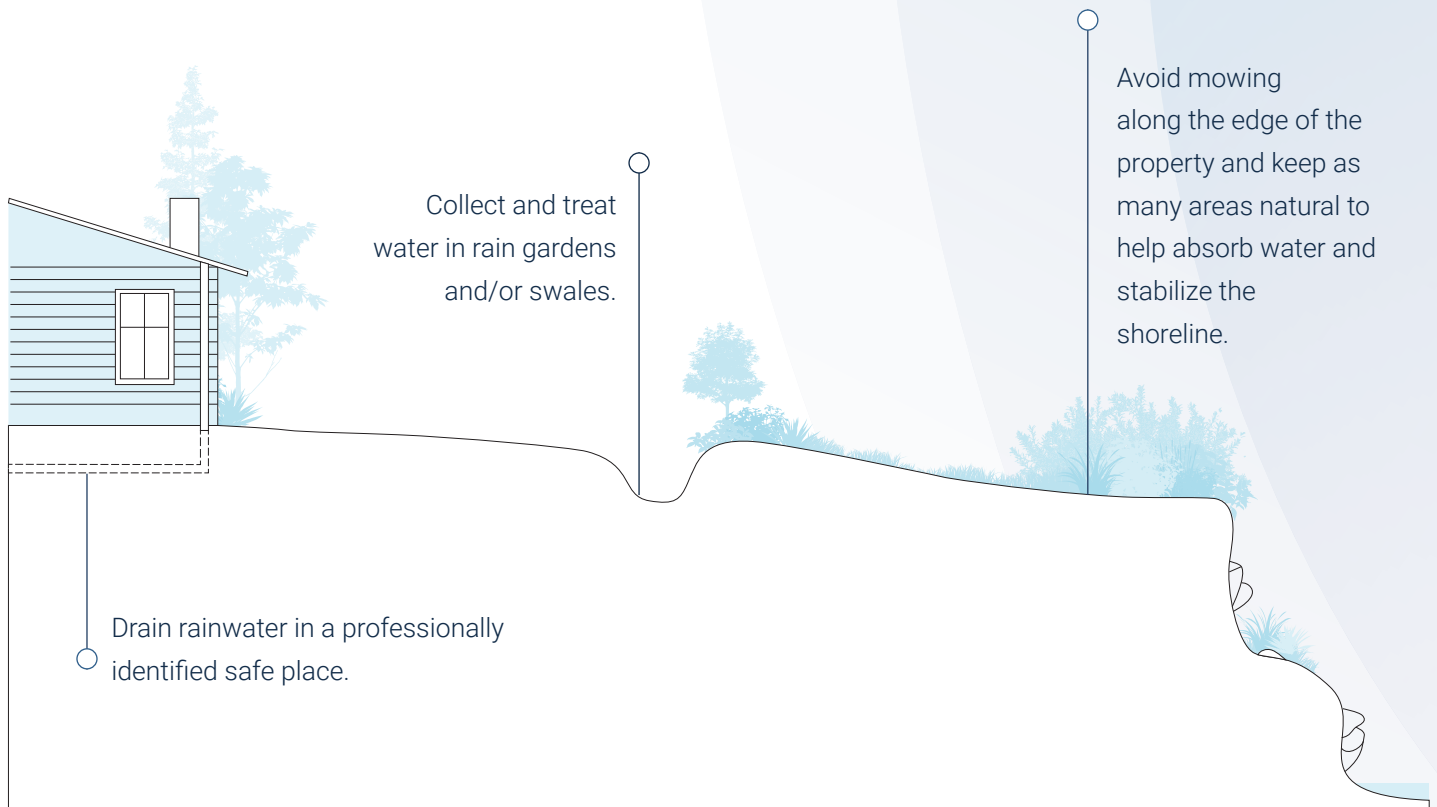
**Cautions:** Using fencing techniques to prevent erosion works best along shorelines that are relatively sheltered from strong winds and waves and where there are no large rocks near the surface (which can make it hard to install stakes). This technique involves a lot of work and enough woody material.

**Professional expertise needed:** Significant erosion issues are best assessed by a trained professional. A landscape architect or similar professional may be able to provide advice about plant selection and develop a planting plan.

**Maintenance:** Plants may need water and nutrients to establish and thrive. They will often regrow naturally if damaged, but replanting may occasionally be required. As a living fence grows, additional weaving will be required to incorporate new growth back into the structure. Pruning may be required seasonally to encourage growth in the desired direction.

## Stormwater Management

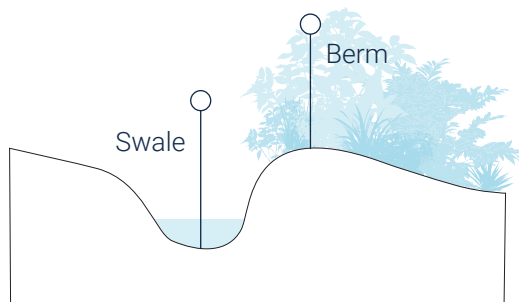
Natural features on your property can reduce the impacts of coastal flooding from heavy rain. These techniques aim to slow water on site and encourage infiltration into the soil, reducing flooding and erosion. Water can also be temporarily stored in ponds and/or rain barrels that collect water during heavy rain for later irrigation.



*Stormwater management techniques*

## Swales & Berms

Swales and berms are stormwater management features that capture and store rainfall, allowing for infiltration into the soil. Swales are shallow channels with gently sloping sides that may be natural or human-made. Artificial swales are often designed to reduce rainwater from running off properties with steep slopes to reduce erosion and sedimentation.



*Berm and swale profile*

Swales increase infiltration into the ground and are called “bioswales” when they include plants in their construction. Berms are constructed on the down slope of the swale, using the removed material to create a mound that runs parallel to the swale. Berms can be planted with salt spray tolerant grasses, shrubs, and trees.

**Coastal hazard:** Flooding and erosion

**Cost:** Low - medium

**Permits:** Typically not required if working above the ordinary high-water mark, and if no natural watercourse is altered.

**How:** Shallow trenches are dug on contour and backfilled with material such as woodchips. The excavated material is placed parallel on the downslope side of the swale to create the berm. The swale can be planted with water-loving plants or filled with mulch, and the berm is planted with shrub and tree species.

**Opportunities:** Reduces the amount of stormwater runoff from heavy rains that can cause erosion. These solutions can decrease the potential of flooding and pollution. They have relatively minimal maintenance requirements, are cost-effective, improve property appearance, and provide habitat for wildlife. Swales can help recharge the ground water table and reduce the impacts of sea level rise on coastal aquifers.

**Cautions:** Provides limited protection from extreme flooding when the ground can't absorb any more rain. Swales need plenty of space and must be built on a contour and level so they don't channel water and create erosion problems.

**Professional expertise needed:** A stormwater engineer or landscape architect can assess site conditions and ensure proper swale sizing to prevent runoff or erosion.

**Maintenance:** Water swale plantings during dry periods. Add mulch and additional plants as needed.



## Rain Gardens

Rain gardens are a stormwater management technique that capture and store rainfall in shallow depressions in the landscape. They are designed to reduce flooding and erosion by storing water and allowing it to infiltrate into the water table. These depressions may be filled with gravel or woodchips, and are planted with water-loving grass, shrubs, and tree species.

**Coastal hazard:** Flooding and erosion

**Cost:** Low - medium

**Permits:** Typically not required if working above the ordinary high-water mark, and if no natural watercourse is altered.

**How:** Shallow depressions are dug in low areas that collect water during rainfall events. The excavated material can be placed along the lowest edge of the rain garden to create a small berm and retain water. The rain garden may be backfilled with sand, gravel or woodchips, and planted with water-loving species. For more information, see [A Complete Guide to Building and Maintaining a Rain Garden](#) and [Rain Garden Mini Guide](#).

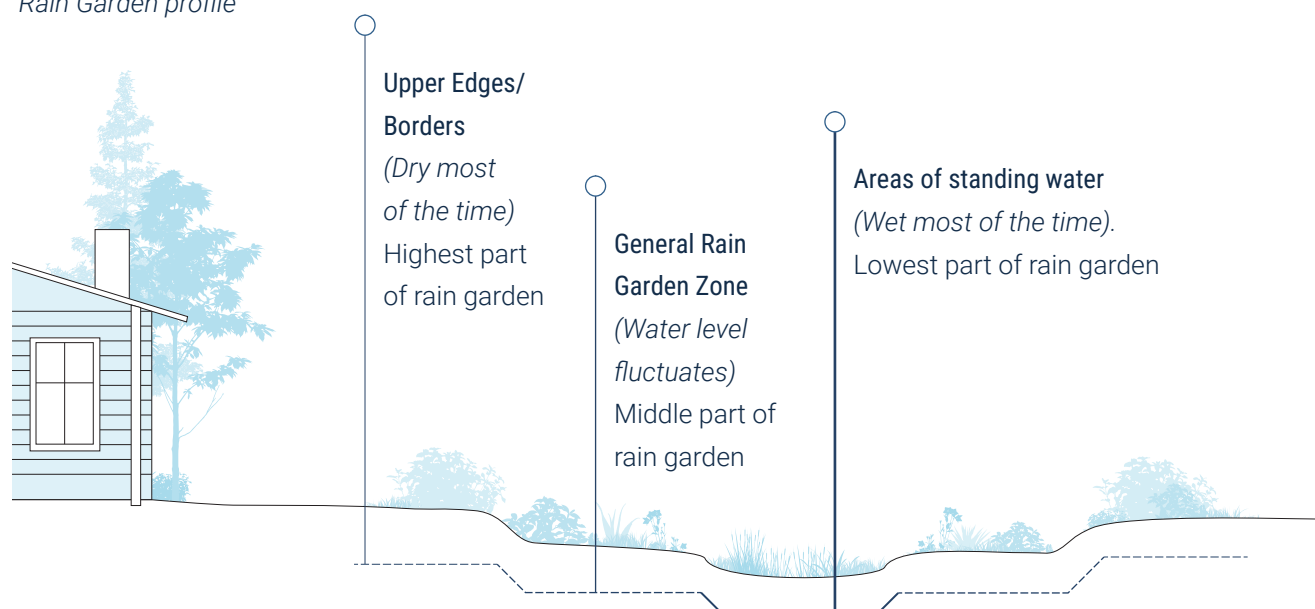
**Opportunities:** Reduces the amount of stormwater runoff from heavy rains that can cause erosion. These solutions can decrease the potential of flooding and pollution. They have relatively minimal maintenance requirements, are cost-effective, improve property appearance, and provide habitat for wildlife. Rain gardens can help increase the infiltration into coastal aquifers. Rain gardens can be relatively small or cover large areas.

**Cautions:** Provides limited protection from extreme flooding when the ground can't absorb any more rain. Work with a professional to test soil infiltration before installing rain gardens on your property.

**Professional expertise needed:** A stormwater engineer or landscape architect can help assess whether the site has adequate drainage for a rain garden. In areas with poor infiltration, rain gardens may need design adjustments to prevent standing water. Proper sizing is important to ensure the rain garden can handle runoff from the surrounding area.

**Maintenance:** Water rain garden plantings during dry periods. Add mulch and additional plants as needed.

Rain Garden profile



Upper Edges / Borders	General Rain Garden Zone	Areas of Standing Water
<ul style="list-style-type: none"> <li>• Northern Bayberry (<i>Myrica pensylvanica</i>)</li> <li>• Virginia Rose (<i>Rosa virginiana</i>) - unless on the edge</li> <li>• And almost any other native species that can tolerate drier areas</li> </ul>	<p><b>SHRUBS</b></p> <ul style="list-style-type: none"> <li>• Red-osier Dogwood (<i>Cornus sericea</i>)</li> <li>• Common Elderberry (<i>Sambucus canadensis</i>)</li> <li>• Eastern Buttonbrush (<i>Cephalanthus occidentalis</i>)</li> <li>• Steeplebush (<i>Spiraea tomentosa</i>)</li> <li>• Swamp rose (<i>Rosa palustris</i>)</li> <li>• Common Winterberry (<i>Ilex verticillate</i>)</li> <li>• Highbush Cranberry (<i>Viburnum opulus</i> var. <i>americanum</i>)</li> <li>• Black Chokecherry (<i>Aronia melanocarpa</i>)</li> </ul> <p><b>GROUNDCOVER:</b></p> <ul style="list-style-type: none"> <li>• Yellow Marsh Marigold (<i>Caltha palustris</i>)</li> <li>• Ostrich Fern (<i>Matteuccia struthiopteris</i>)</li> </ul> <p><b>GRASSES:</b></p> <ul style="list-style-type: none"> <li>• Little Bluestem (<i>Schizachyrium scoparium</i>)</li> <li>• Old Switch Panicgrass (<i>Panicum virgatum</i>)</li> <li>• Bluejoint Reed grass (<i>Calamagrostis canadensis</i>)</li> </ul>	<ul style="list-style-type: none"> <li>• Harlequin Blue Flag (<i>Iris versicolor</i>)</li> <li>• American Sweetflag (<i>Acorus americanus</i>)</li> <li>• Hard-stemmed Bulrush (<i>Schoenoplectus acutus</i>)</li> <li>• Broad-leaved Cattail (<i>Typha latifolia</i>)</li> </ul>

## Selecting Appropriate Plants

Select plants that are native to Nova Scotia and are suitable for the coastal environments, and ensure you are not growing any invasive species. You will also want to consider plant preferences for sun/shade and soil moisture.

- Check out the Nova Scotia Invasive Species Council – [Grow Me Instead](#) resource for alternatives to invasive species.
- For a list of native coastal plants, see the [Guide to The Atlantic Coastal Plain Flora of Nova Scotia](#)



*Virginia rose (Rosa virginiana)*



*Common Elderberry (Sambucus canadensis)*



*Harlequin Blue Flag (Iris Versicolor)*



*Swamp milkweed (Asclepias incarnata)*

## Conclusion

The Nature-based solutions shared in this guide are soft, green solutions to address coastal impacts of climate change. Nature-based solutions may not be suitable for all properties on their own. Before you act, observe your property, and understand the impacts the coast is facing. Use existing mapping products and tools to understand where the backshore begins, and what solutions may be suitable. These actions are best suited in low-wave energy environments. This guide covers actions above the ordinary high-water mark, within the backshore; always check if you need permits before you act.





## Glossary

**Backshore:** The backshore is the area where waves only reach during big storms. It can provide natural protection against flooding and erosion.

**Erosion:** the removal of sediment such as sand, silt, or gravel, by wind or water. <sup>NPS</sup>

**Foreshore:** The foreshore is the area between low tide and high tide and can change through wind and wave action.

**Nearshore:** The nearshore is the area where waves become steeper and break.

**Nature-based solutions** is an umbrella term that refers to a range of ecosystem-focused methods to tackling societal challenges. They can be used in both inland and coastal environments. Nature-based solutions are defined as actions that restore, manage, and protect ecosystems while addressing societal challenges like natural disasters and water security to benefit both people's well-being and healthy ecosystems. <sup>IUCN</sup>

**Storm Surge:** Storm surge is the rise in seawater level during a storm, measured as the height of the water above the normal predicted high tide. The positive or negative difference in sea level from the predicted astronomical tide, is due to the forces of the atmosphere. The two main atmospheric components that contribute to a storm surge are air pressure and wind. <sup>GOC</sup>

**Weathering:** The breaking down of rock material by things like heating and cooling, frost or crystal wedging, or chemicals, like acid in rain. The products of weathering (sand, silt, gravel, rock fragments) are then removed by erosion. <sup>NPS</sup>

