

Bioengineering Methods and Case Studies in Vermont

Restoring Living Shorelands

2020 Natural Shoreland Erosion Control Certification







Amy Picotte, Vermont Shorelands Program



SEAWALL IMPACT ON INLAND LAKES

UPLAND

HARD SEAWALL Wave energy that is deflected off vertical walls can cause erosion, also called scour, near seawalls.

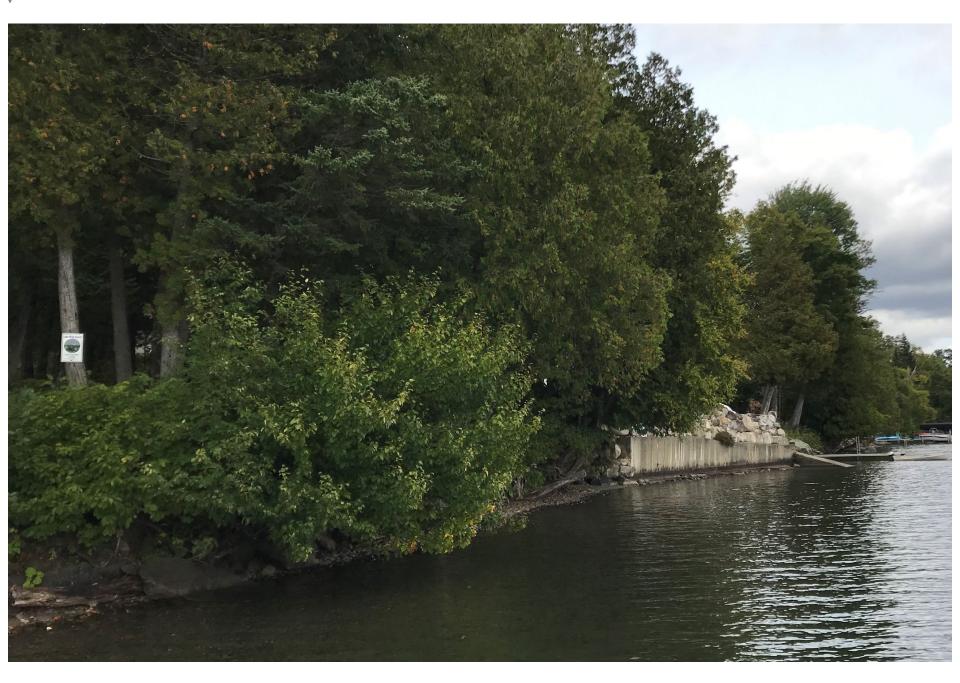
DOES YOUR SHORELINE
ALLOW TURTLES AND
OTHER ANIMALS TO
TRAVEL BETWEEN THE
WATER AND THE LAND?



SCOUR

MICHIGAN SEA GRANT









Bioengineering is a softscape engineering approach to stabilize shorelands with:

- native plants,
- biodegradable products, and
- other natural materials.



Vermont Learning from Others



Thank You!























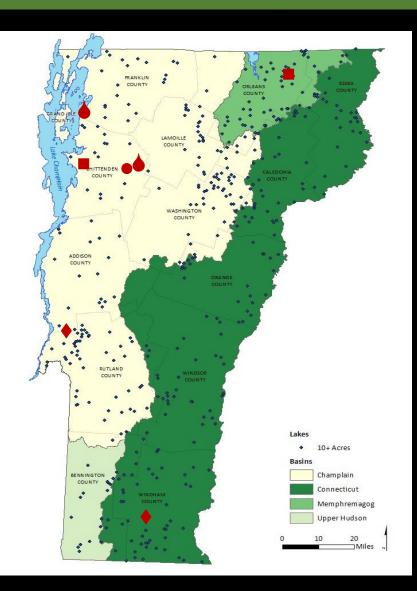








Case Studies of Bioengineering Installation Projects



Live Stakes

- **♦** Lake Champlain
- **♦** Waterbury Reservoir

Fiber Coir Rolls

- Lake Iroquois
- Island Pond (also Lift System)

Encapsulated Soil Lifts

- Lake Bomoseen
- Lake Raponda

Live Crib Wall

Waterbury Reservoir



Live Staking on Lake Champlain







Live Stakes:

vegetative cuttings

planted in fall or spring

work well on rocky steep slopes









Live Staking on Waterbury Reservoir



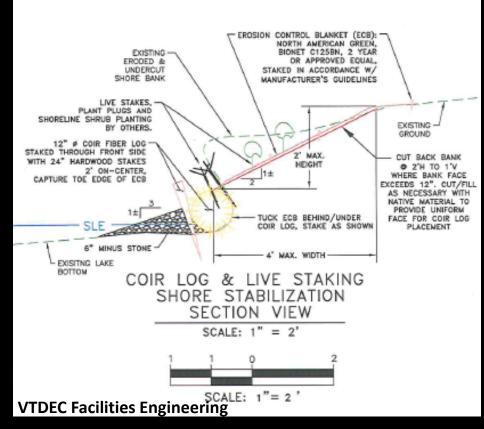




Table 1

2015 Lake Iroquois Fiber Coir Rolls

















Brian Majka, GEI Consulting from Michigan Led Training



Lake Iroquois, Williston – Shoreland Restoration







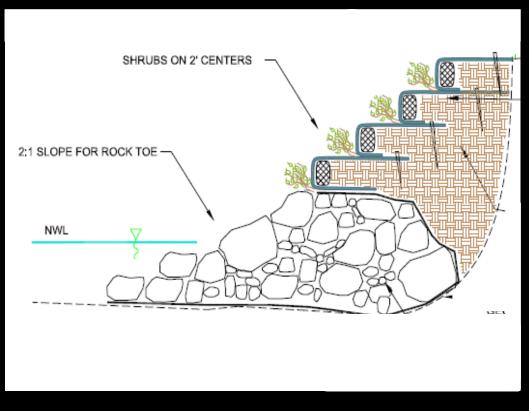






2017 Lake Bomoseen Encapsulated Soil Lifts





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Natural Shoreland Erosion Control - Partners Training







Encapsulated Soil Lifts







June 2019



August 2020



Natural Plant Mortality and Cultural Plant Mortality









Lake Raponda Encapsulated Soil Lifts







Natural Shoreland Erosion Control - Partners Training







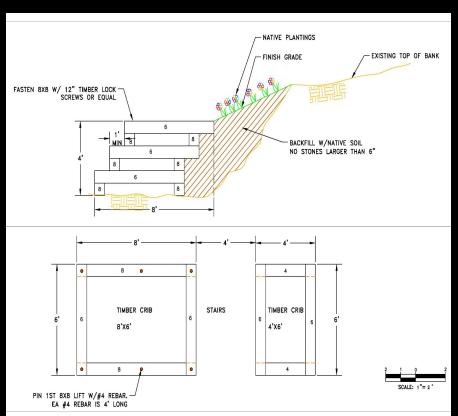




2018 Waterbury Reservoir Live Crib Wall









Live Crib Wall at Waterbury Reservoir





2018 – Just Installed



July 2020 – two years later



2020 Salem Lake, Derby

















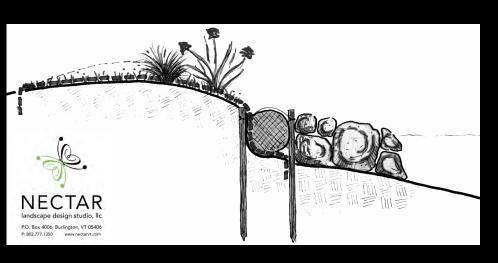
2020 Maidstone Lake – Ice Push (2016) Fix (2018)



Maidstone Lake - Heather Robinson from Essex NRCD; Northwoods; Nectar Design

















North Hero, Lake Champlain sloughing, eroding shore









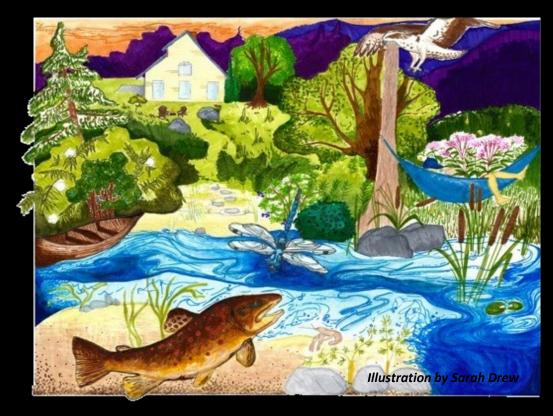


2020 Bioengineering



Bioengineering Tips

- ✓ Plan for 20% Plant Mortality
- ✓ Plan for Replacement Plantings
- ✓ Simplify Planting Selections
- ✓ Use Clean Soils
- ✓ Use Wildflower Seed
- ✓ Signage Is Important
- ✓ Install Temporary Fencing (Sand Fence)
- ✓ Use Biodegradable Jute ECB Instead of Geotextiles
- ✓ Work with NSECC Partners













Vermont Bioengineering Projects Natural Shoreland Erosion Control Partnership

Amy Picotte, Vermont Shoreland Program