If you attended the webinar or watched the video, please fill out the evaluation survey: https://www.surveymonkey.com/r/8L5SZXY


Regenerative landscaping:

How to make suburban landscapes part of the climate solution

Dr. Sara Via
Professor & Climate Extension Specialist
UMD College Park
svia@umd.edu

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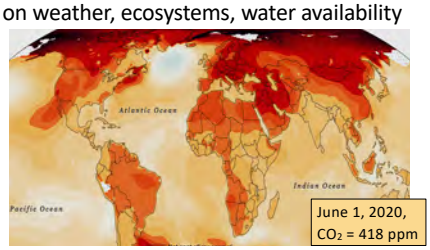
The Climate Problem

Warming from unprecedented increases in atmospheric CO_2 already causing serious impacts on weather, ecosystems, water availability



For the best future, we must reduce emissions & remove carbon from the atmosphere

2

The Soil Problem

- Soil & habitat seriously degraded by conventional agricultural practices
- Ability of soil to soak up, hold & purify water reduced ➔ water problem
- Soil microbial communities degraded, reducing nutrient cycling, more use of fertilizer & chemicals ➔ water problem
- Habitat for natural enemies & pollinators lost, increasing pests ➔ biodiversity problem


3

The Water Problem

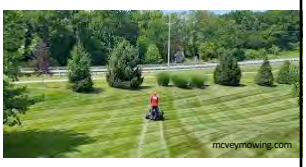
- Streams & coastal waters polluted by chemicals, pathogens & sediment
- Nutrient runoff (fertilizer, manure) increases pollution➔ "dead zones"
  Nitrogen runoff from Midwest has cost Gulf fishermen up to 2.8 billion/year for 30 years!

- More heavy rains, higher sea level➔ more inland & coastal flooding, erosion & runoff
- More summer heat, hotter streams, more drought

4

The Biodiversity Problem

- Dramatic loss of habitat & biodiversity from development, climate change & agricultural practices
- In landscaping, reliance on mowed turfgrass causes habitat loss & reduces insect biodiversity

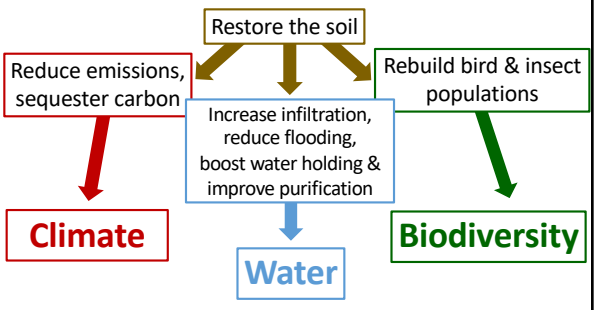


- Loss of birds and insects in introduced monoculture threatens ecosystem function, allows pests to increase & reduces pollination

SOLUTIONS??

5

Rethink our suburban landscapes and embrace practices that



How? Rethink lawn & increase native perennials

6

Lawn is the default landscape

"Ideal home" includes expanse of manicured lawn

- Long history of lawn as symbol of wealth & home ownership
- Requires little thought to choose & install
- Upkeep is familiar, many suburban residents grew up with lawn care
- Can be easily hired out
- Most common municipal & commercial landscape

The dark side of lawn-- environmental & economic impacts

7

The environmental cost of lawn

- 42 million acres of lawn in US, (1.3 million acres in Maryland)
- uses 30-50% municipal water
- yard tools➔ 5% US emissions
- 17 million gallons fuel spilled/yr
- Lawns often over-fertilized NO_3 runs off and N_2O emitted
- 10x more nitrogen & chemical runoff from lawns/acre than from agricultural fields
- monoculture of introduced species -- poor habitat

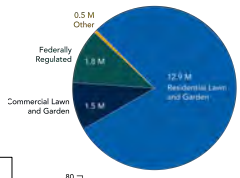
Lawn contributes to all four key environmental problems

8

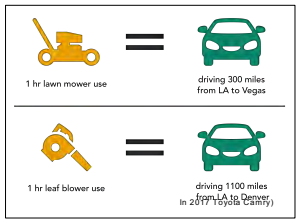
The inefficiency of yard equipment

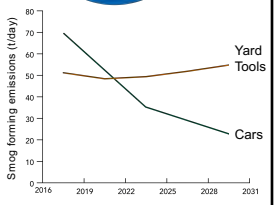
How many yard tools in California?

(13.7 m passenger vehicles)



How about emissions?





From: California Air Resources Board (carb.ca.gov)

Huh??

9

The economic cost of residential lawn

When was the last time you thought about this?

Mow lawn yourself

Plus: fertilizer, herbicides, insecticides, fungicides, gas, time (70-100hrs/yr)

Use lawn service

Plus: fertilizer, core aeration herbicides, insecticides, fungicides

https://www.yourgreenpal.com/blog/mow-the-lawn-or-pay-a-service

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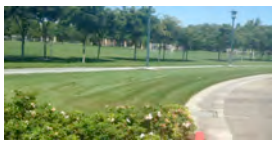
The cost of mowed open space



Howard Co, MD ~ 4000 acres mowed turfgrass, excluding parks
Columbia, MD - 1600 acres mowed turfgrass

- mowed every 1-2 weeks during the summer,
- emissions from thousands of gallons of diesel
- requires tons of fertilizer and chemicals
- ballpark cost: $750-2000/acre annually ($8m for HoCo?)

Open space could be part of the climate solution instead of part of the problem

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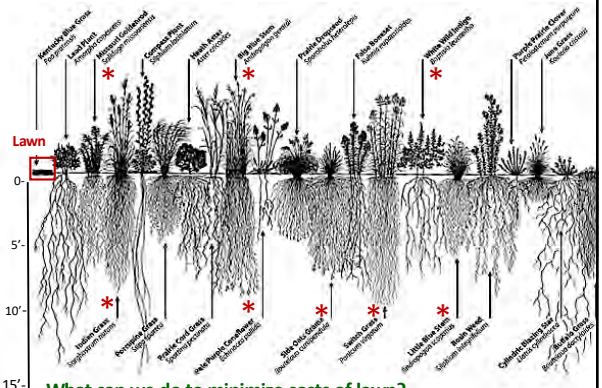
Why lawn needs so much maintenance



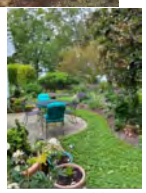
What can we do to minimize costs of lawn?

Conservation Res. Inst. 1995

12

Approaches to reducing lawn impact

- **Remove lawn, replace with native plants**
  - OK for experienced gardeners but can be threatening
  - Hard to find alternatives for large scale landscapes
- **Accept imperfection**
  - Stop using fertilizer &chemicals
  - Let lawn go dormant in summer
  - Mow high with mulching mower
  - If it's green, mow it
- **Find a substitute that is climate-friendly**
  - The Lawn Mimic

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Lawn mimics maintain the look

Lawn Mimic: a mix of low & slow growing grasses (fine fescues) plus optional microclover (or white clover) for N

Lawn mimics look like regular lawn, but..


- No fertilizer or chemicals
- 10-20% as much mowing
- ~80% less CO_2 emissions
- Some carbon sequestration

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Lawn Mimic Field Trials

Howard County Innovation Grant 2020

- collaboration w/ Howard Co. and CA
- testing four lawn mimic mixes (2 with a native grass)
- bare ground: two trials of each in sun and shade


Lessons so far:

- Site preparation is essential!

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Lawn Mimic Field Trials

Howard County Innovation Grant 2020

Overseeding: Can we convert current turfgrass stands to lawn mimics by overseeding?

- Transform mowed open space yet keep open look

Benefits

- No fertilizer or chemicals
- up to 80% less mowing
- Cost potentially reduced from $2000/acre to $400-600/acre for a savings up to $5.6 million/yr
- Gigantic reduction of carbon emissions from lawn equipment

Lessons so far: Site preparation!!!

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Increase use of native perennials in landscape beds

Compared to using only annuals,

- Save resources (& time), reduce carbon footprint
- Increase pollinators & biodiversity
- Deep-rooted plants sequester carbon (see Webinar #1, Healthy Soil)
- Deep rooted perennials help manage stormwater
- Usable in many settings


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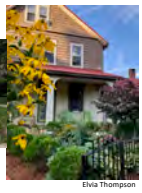
Native perennials can be planted at any scale

- Containers
- Raised beds
- Small area in front yard
- Open space in HOA


This meadow was a community selling point!
Zimmerman,2010

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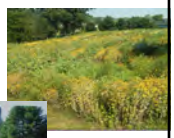
Establishing a meadow or pollinator bed

From seed
- Not for the beginner
- Requires major site prep & planting equipment
- What will germinate?
- Yearly mowing at increasing heights



Zimmerman,2010

From plants/plugs
- More controlled composition and growth (40% grasses, 60% forbs)
- Still need to worry about weeds

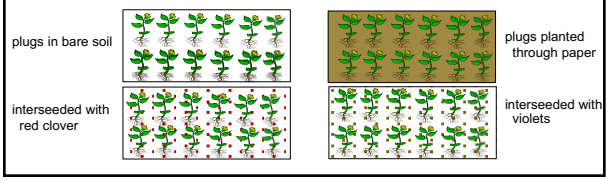

Zimmerman,2010

19

Weed-free perennial beds

Need for frequent hand weeding a deterrent to establishing native plant beds

Howard County Innovation Grant 2020
-- Field trials of weed reduction strategies
-- interseed plugs with red clover or violets
-- plant plugs through brown kraft paper
-- in fall, overseed with pollinator mix



20

Weed-free perennial beds

Field trial, Summer 2020
- Bare ground
- Planted through paper
- Interseeded with red clover





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Weed-free perennial beds

Field trial, Summer 2020

Bare ground


Weeding: 2 hrs. 20 min


4 weeks later

Planted through paper


Weeding: 45 min


4 weeks later

22

Native perennials: Issues

- Can be hard to find native plants for purchase or landscapers who plant natives (see resource list)
- Not too hard to start from seed

- Ecotype or not?
- Are locally adapted plants better or "more natural"?
- Genotypes from elsewhere might be maladapted
- But they also provide new "raw material" for adaptation

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Combined climate and watershed benefits of pollinator gardens

Use deep-rooted native plants in swales, raingardens & median strips to
- control flooding,
- boost pollinators and
- sequester carbon


Aaron Volkening


Aaron Volkening

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Combined climate and watershed benefits of pollinator gardens


Zimmerman, 2010


Zimmerman, 2010

Deep-rooted perennials filter & purify runoff water

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Using deep-rooted perennial grasses to stabilize streambanks

- Mowing right up to bank causes rapid erosion
- Stop mowing 4-6' out
- Plant deep-rooted grasses, i.e. Virginia wild rye - OK in shade, attractive in winter


gebl.org

ncsu.edu, Options for Backyard Stream Repair


northcreeknurseries.com

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Foodscaping: Planting food in landscape beds

- Mixing fruits & veggies into landscape beds increases biodiversity
- Create a neat edge w/ herbs, garlic, peanuts
- Mix veggies with flowers behind the edge
- Edible shrubs- blueberries, raspberries, aronia, serviceberry
- Edible trees- hazelnut, fruit trees
- Replace ornamental grasses with wheat, barley, oats, rice


All from Arthur, 2018

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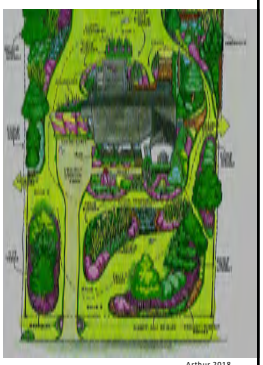
Foodscaping: Make a plan

- You may need professional help
- Lay out pleasing array of beds w/ lawn (mimic) in between
- Plant trees, shrubs, perennials as permanent scaffold
- Add annual plants seasonally


Arthur 2018

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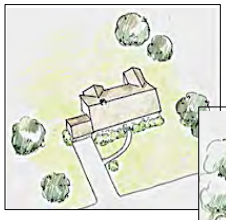
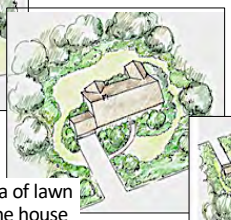
Progressively reducing turfgrass in community


Typical layout


Small area of lawn around the house


Contiguous trees & plantings benefit wildlife and soil

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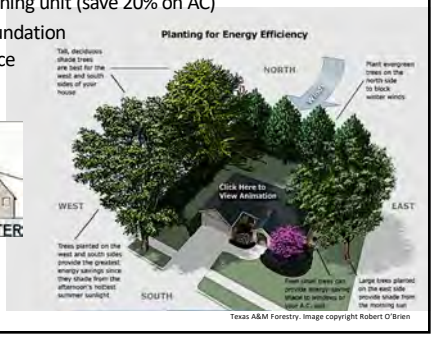
Landscaping To Reduce Energy Use

- Plant evergreens north or windy side (save 20% on AC)
- Deciduous trees on south & west side
- Shade air conditioning unit (save 20% on AC)
- Shrubs around foundation foundation reduce heat loss



Texas A&M Forestry. Image copyright Robert O'Brien

30

Working with the neighbors, HOA, local govt.

- **Know the rules,** weigh your options
- **Make your yard fit in, i.e.,** lawn mimic™ & perennial beds with "cues to care", clear edge, bird bath, keep tidy
- **Share your vision** & design w/neighbors
- **Reach out** to Board or local government with information on environmental value & cost savings of your plan
- **Start small or in back yard**

Be enthusiastic, be persistent, & stay positive!


Zimmerman, 2010


Penick, 2013


Penick, 2013


Elvia Thompson

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Working with the neighbors: Case study

Columbia, MD Townhome Community

- Resident talked w/ Board about environmental & ecological benefits of reducing mowed lawn
- Found a location for a demonstration
- Researched options & made a plan
- Worked with the landscapers
- Planted several small pollinator beds in an out-of-the-way location
- Plans to expand on that next year

Jean Silver-Isenstadt


Jean Silver-Isenstadt

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We can manage our suburban landscapes to reduce emissions, store carbon & increase biodiversity…

All while saving time & money!


Aaron Volkening


David Alexander


Ingrid Blanton

svia@umd.edu

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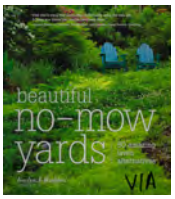

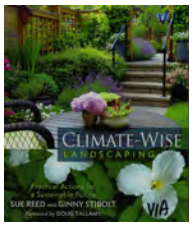

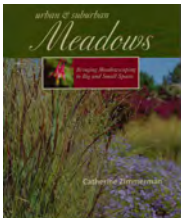

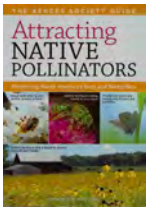

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Dr. Sara Via, svia@umd.edu

Resources for Regenerative Landscaping Webinar

Evaluation Survey for webinar. Please fill out the evaluation if you attended the webinar or watch the video. It really helps me to get your feedback!
https://www.surveymonkey.com/r/8L5SZXY

Native Plants for Chesapeake Bay region—a totally non-exhaustive list. Many more great sites available on the web- just search.

Chesapeake Bay Native Plant Center:
https://www.chesapeakebay.net/action/howtotips/article/how_to_choose_and_use_native_plants

http://www.nativeplantcenter.net/

https://www.chesapeakebay.net/action/howtotips/category/in_your_backyard

Master Gardeners and HGIC: This site contains many good links for further exploration
https://extension.umd.edu/calvert-county/master-gardeners/native-plant-information

Stormwater management/green infrastructure

The Watershed Project: this site has several sections with a lot of good ideas
http://thewatershedproject.org/our-programs/greening-urban-watersheds/

Howard Co. Government, Live Green Howard: a goldmine of information!
https://livegreenhoward.com/land/

Books. I used a few ideas from each of these books, however, this is not an endorsement of every single idea in each book. I put a * by the books I've used most. You can get some of these used on Amazon—I've had very good luck with that.

*Zimmerman, C. 2010. Urban and Suburban Meadows. Matrix Media.
Penick.P. 2013. Lawn Gone! Ten-speed Press.
*Reed, S and G. Stibolt. 2018. Climate-Wise Landscaping. NSP.
*Xerces Society. 2011. Attracting Native Pollinators. Storey Press.
Hadden, E. 2012. Beautiful No-Mow Yards. Timber Press.
*Walliser. J. 2015. Attracting beneficial bugs to your garden. Timber Press.
Arthur, B. 2017. The Foodscape Revolution. St. Lynns Press.

Seeds.
Lawn Mimics. We are working on a good mix that will work well in a range of situations. We aren't there yet, but if you want to get started with a commercial mix, here are several:

1. Fine fescue mix. I planted this mix in my back yard, along with some white clover. That combo worked well for me. This is also the grass mix I planted along my drive—pics included in the webinar.
https://www.outsidepride.com/seed/grass-seed/fescue-grass-seed/legacy-fine-fescue-grass-seed.html

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2. Microclover. Here's the one I used—other microclover seed is hard to find. If you are ok with white clover and its more abundant flowers, it is much cheaper and easier to find, either at Southern States or online. Link for microclover:
https://www.outsidepride.com/seed/clover-seed/miniclover.html

3. "Ecolawn". There are a couple of commercial formulations of low-mow grass. Here is one that contains a mix of 5 different fine fescues. It is a lot more expensive than the OutsidePride seeds.
https://www.wildflowerfarm.com/index.php?route=product/category&path=20

Native Plant Seeds.
Here are several good websites for native seeds (and maybe also plants). They have good planting instructions also. I've had good luck just sprinkling seed over a plug flat filled with seeding mix. Then I kept them inside under LED shop lights. The plants with complex germination needs probably didn't germinate, but a lot of different plants did. If you want to put a little more effort into it, try this site for some ideas:
https://wildseedproject.net/how-to-grow-natives-from-seed/
All of the sites below have a great selection of seeds, and also a lot of information on planting etc.

1. Ernst Conservation Seed. https://www.ernstseed.com/

2. Prairie Moon Nursery. https://www.prairiemoon.com/

3. Roundstone Native Seed. https://roundstoneseed.com/