Stormwater Basics for Homeowners

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Urban Conservationist

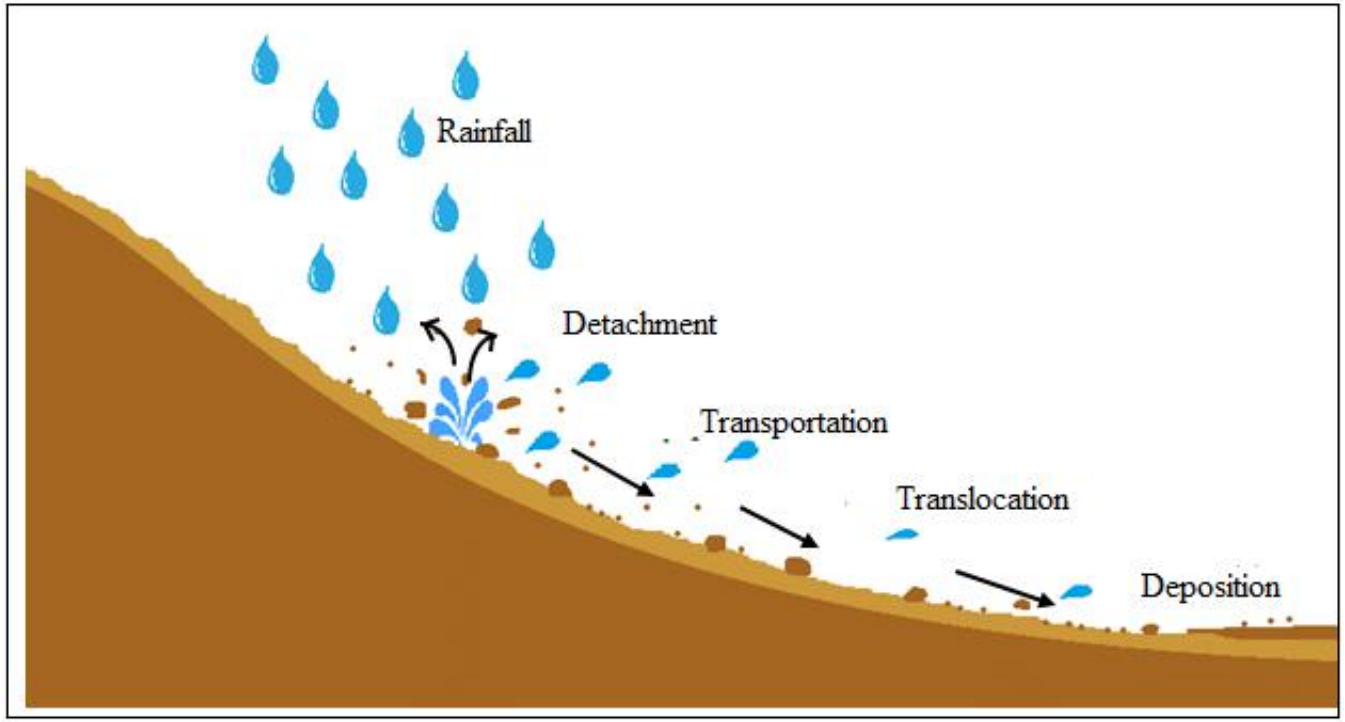
Colonial Soil and Water Conservation District

Colonial Soil and Water Conservation District

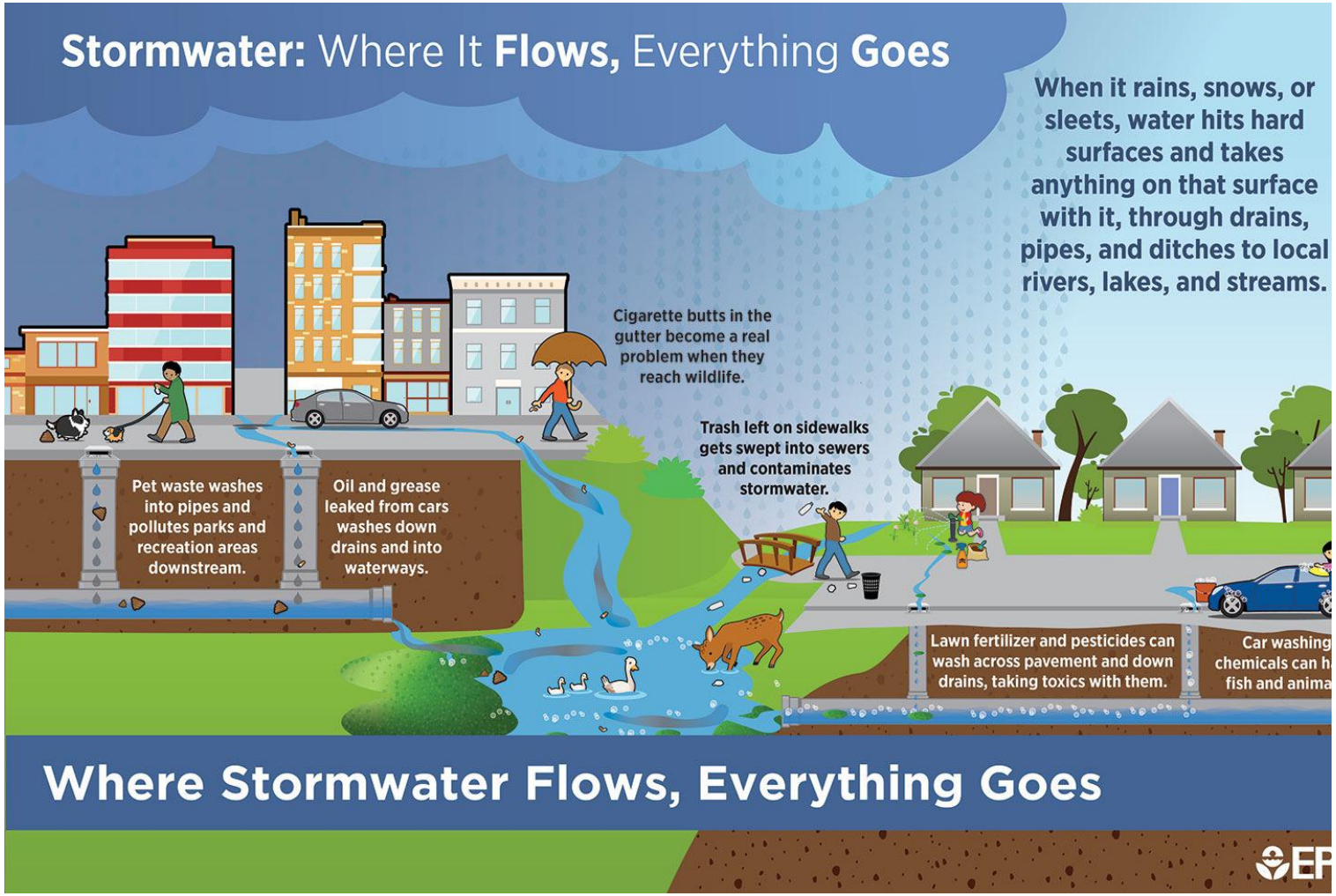
- Regional political subdivision of the state
- Serves Charles City, New Kent, James City, and York Counties and the City of Williamsburg
- Provide technical, educational, and financial assistance when available
- All programs are voluntary; Districts have no enforcement authority
- Historically an agricultural agency, but with the decrease in large-scale farming in this region and growth in residential communities, we've taken on more urban conservation programs

What is erosion?

- The process of breaking down large soil and rock particles into smaller fragments that are carried away from their original location



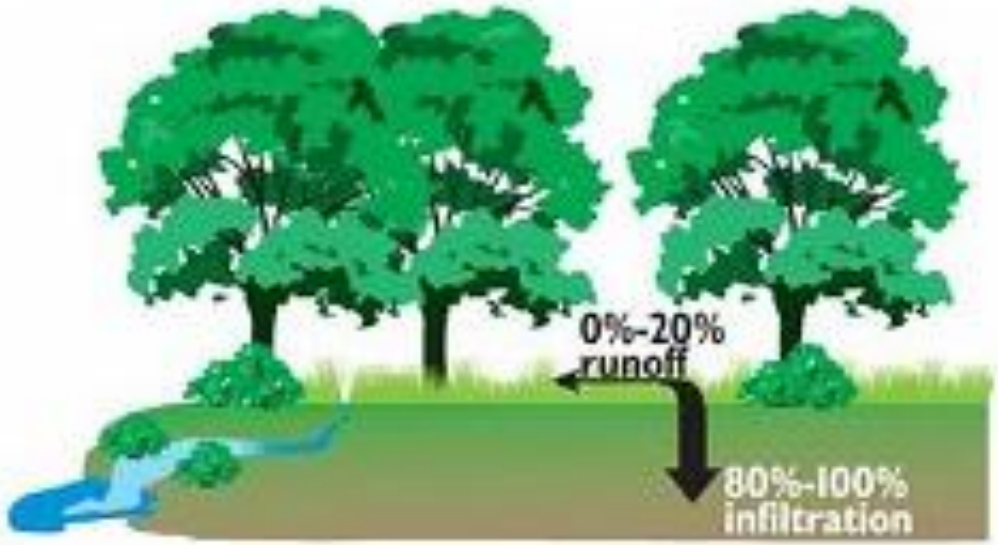
Causes of erosion



What is stormwater?

INCREASE IN STORMWATER RUNOFF WITH URBANIZATION

NATURAL GROUND COVER
0% IMPERVIOUS SURFACE



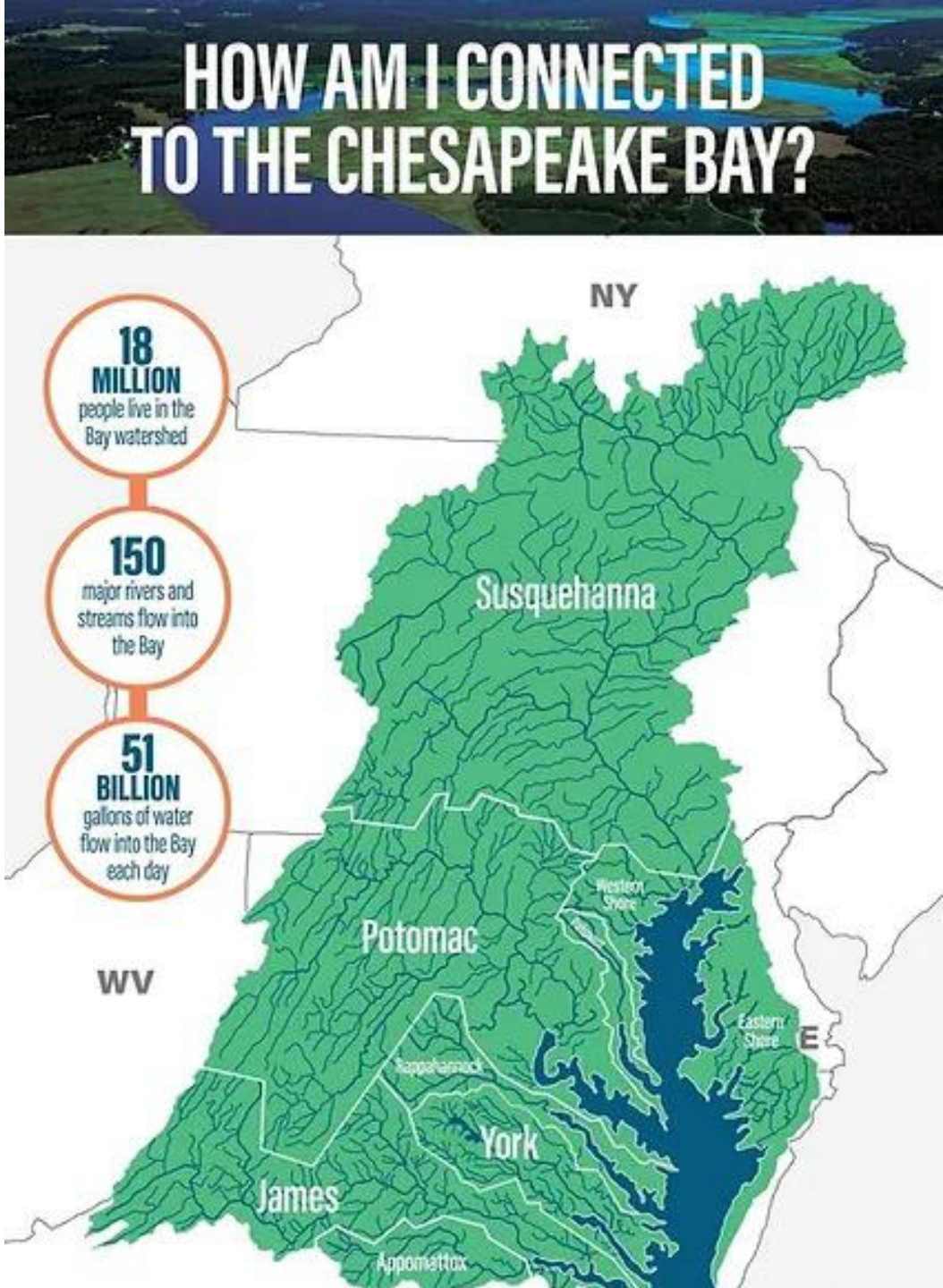
LOW DENSITY RESIDENTIAL
10%-20% IMPERVIOUS SURFACE

URBAN RESIDENTIAL
35%-50% IMPERVIOUS SURFACE

COMMERCIAL/INDUSTRIAL
75%-100% IMPERVIOUS SURFACE

Does stormwater runoff really matter?

- Yes! Recent State of The Bay report shows minimal, if any, improvement across several pollution-based indicators in the Bay:
  - Nitrogen: F; no change from 2020 report
  - Phosphorous: D; 2 point increase from 2020 report
  - Water Clarity: F; 1 point decrease from 2020 report
  - Toxics: D; no change from 2020 report



Common causes of residential erosion & stormwater issues

- Almost always caused by water flow:
  - Stormwater runoff from impervious surfaces
  - Concentrated flow from downspouts and gutters
  - Steep slopes
  - Poor soil
  - Poor vegetative cover

Preventing erosion & stormwater issues

- Maintain appropriate vegetative cover
  - Consider vegetative best management practices (BMPs) such as rain gardens, swales, conservation-based landscaping
- Redirect and capture runoff from impervious surfaces or concentrated flow
  - Consider structural BMPs such as rain barrels, dry wells, splash blocks or downspout extensions, permeable pavement

Planting to prevent erosion

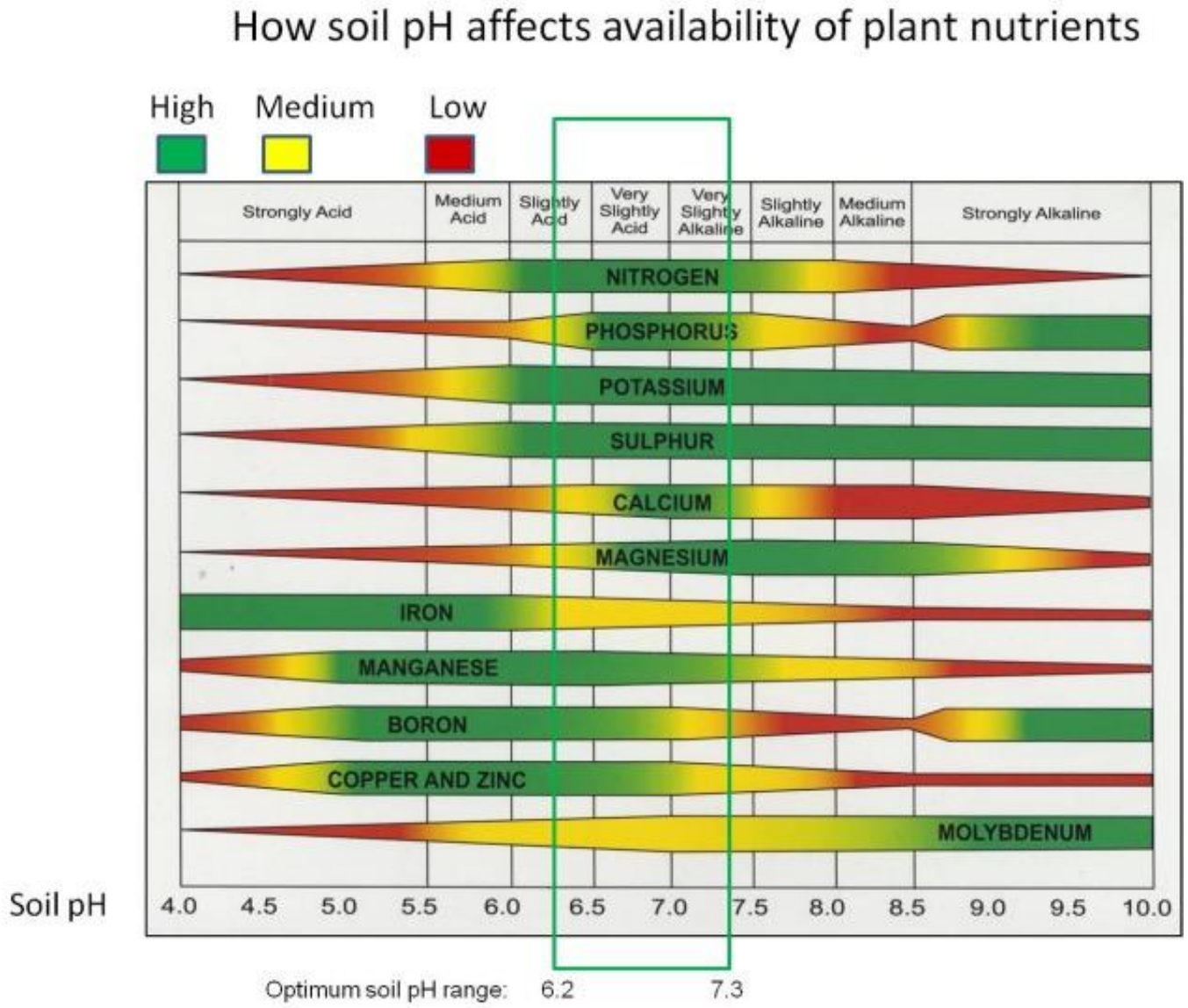
- Plants are vital to preventing erosion. When rain falls on bare soil, it is much more likely to be broken down, loosened, and carried away as runoff.
- By maintaining a healthy lawn or other source of vegetative cover, rainfall is intercepted and slowed by plant tissue, held in the soil, and eventually used by the plant or leached into groundwater.
- Plant roots also help to stabilize loose soil, acting as nets which hold soil in place

Right plant, right place

- Whenever possible, use native plants!
- Native plants have adapted to climatic changes over time and are best suited to grow in that region
- Also offer important habitat and food sources for many pollinators

Importance of Healthy Soil

- We can’t grow healthy plants without healthy soil
- Soil test, soil test, soil test
- Most soil tests will measure:
  - pH
  - Nutrients
  - Organic matter
- Soil amendments



Maintaining a healthy lawn

- The first step in maintaining a healthy lawn is to ensure you have healthy, productive soil
  - Desired pH range of 6.0 – 6.5 ensures essential nutrients are available
  - Responsible application of nutrients and fertilizer will ensure plants have enough essential nutrients to maintain healthy growth
- If you have a lot of shade over your lawn, use shade-tolerant species or consider moss as an effective groundcover
- Aerate the lawn or add compost to break up dense, compacted soil preventing root penetration

Turf Love

- Provides property-specific guidance for homeowners to improve lawn management through site visits with trained Master Gardeners known as Lawn Rangers
  - Soil samples are taken during site visits
- Final report with certified nutrient management plan provided with sample analysis

Stormwater BMPs

- BMP: Best Management Practice
- A BMP is an effective, reliable, and practical solution to a common stormwater issue.
- Examples of BMPs include rain gardens, rain barrels, permeable pavement, living shorelines, and dry wells, among others
- Right BMP, right place

Vegetated Swales

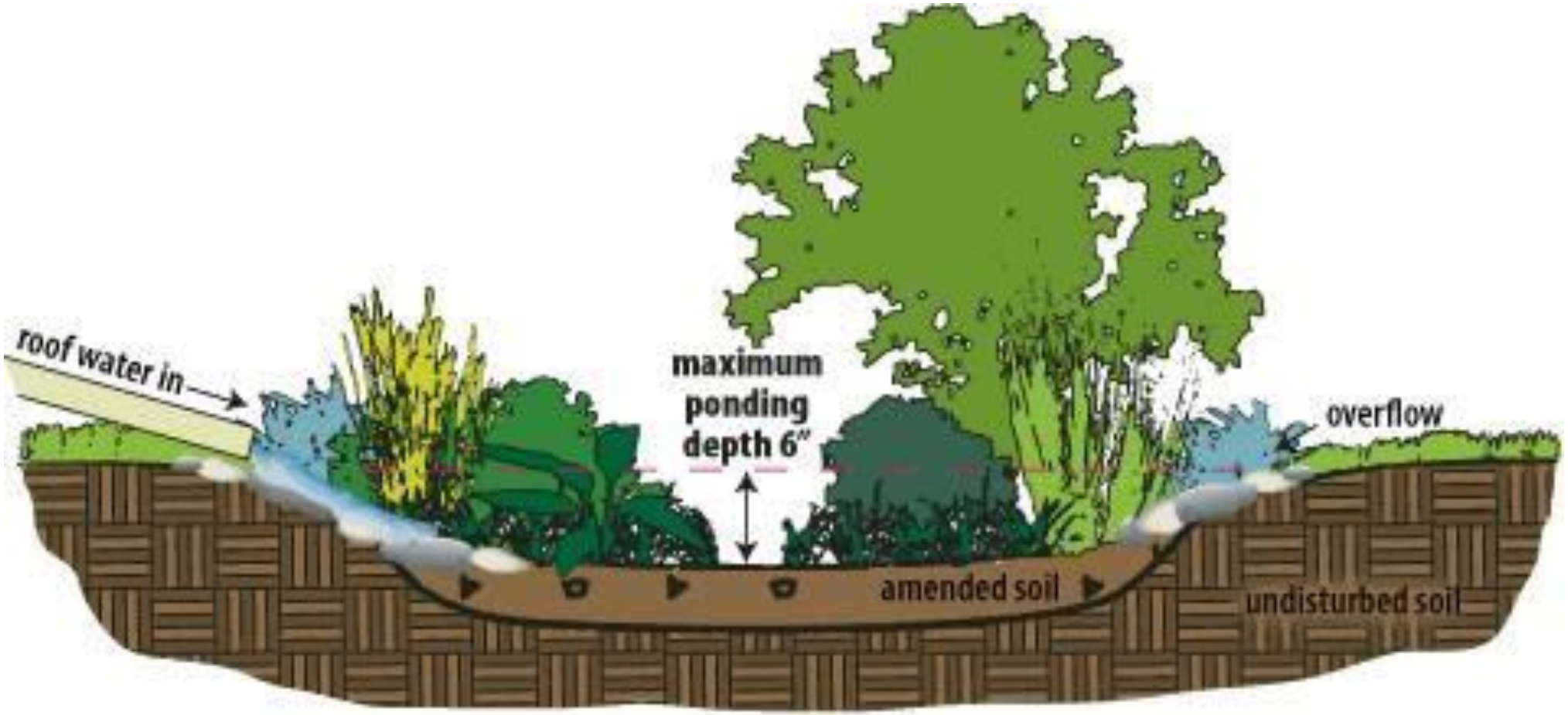
- Constructed channels used to prevent erosion in a stormwater conveyance area
- Allow more opportunity for water infiltration than traditional pipes
- Gentle side slopes decrease erosion concerns
- Engineered soil media and potential underdrain

Residential Swales

Rain Gardens

- Shallow depression that temporarily captures and holds stormwater until it evaporates, infiltrates into the soil, or is absorbed by plants
- Typically feature channelized inlets, engineered soil media, and appropriate hydrophilic plants

Cross section of a rain garden



Dry Wells

- Subsurface storage facility that temporarily stores stormwater runoff received directly from a rooftop
- Captured water infiltrates into surrounding soil
- Can be a structural chamber (left) or an excavated pit filled with gravel

Permeable Pavement

- Alternative paving surface that allows runoff to infiltrate through voids in the pavers into an underlying stone reservoir where it is temporarily stored and released into the soil.
- There are many types of pavers available but they all have similar functions

CROSS SECTION DETAIL

TYP. NO. 8 AGGREGATE IN JOINTS/VOIDS

EAGLE BAY PICPS: MINIMUM DEPTH 3.125"

BEDDING COURSE: DEPTH 1.5"– 2"

NO. 57 STONE OPEN-GRADED BASE: DEPTH 4"

NO. 2 OR 3 STONE SUBBASE: DEPTH MINIMUM 6"

OPTIONAL PERFORATED UNDERDRAIN

SOIL SUBGRADE - ZERO SLOPE

What if my soils don’t drain?

- The BMPs we’ve talked about so far require soils that will drain captured stormwater, usually within 48 hours
  - Use infiltration test to estimate drainage rate
- If soils are slow to drain, extra measures can be taken to mitigate and prevent ponding issues:
  - Gravel reservoirs
  - Underdrains

residential rain garden

(keep 10 feet away from most structures)

Conservation Landscaping

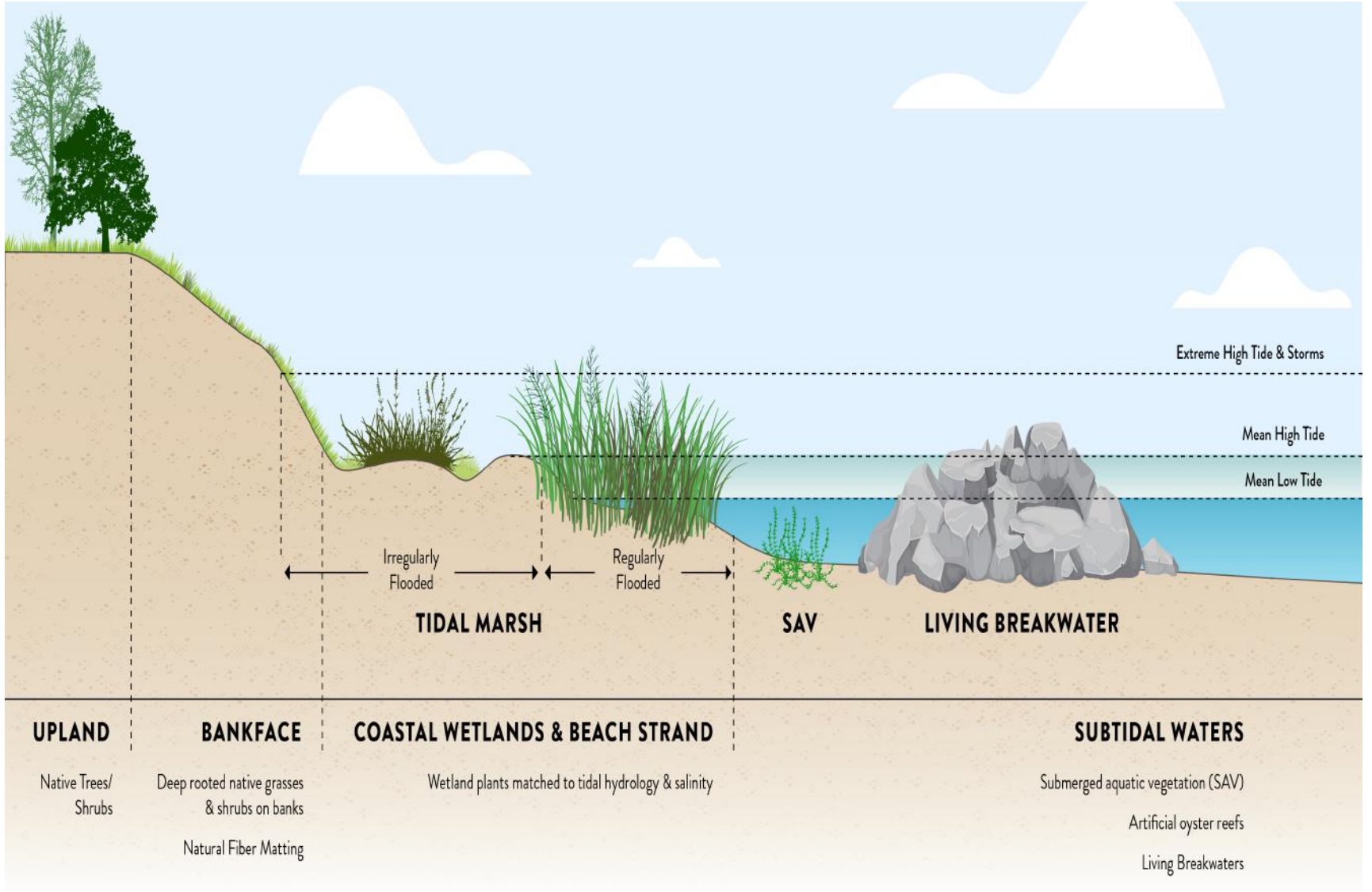
- Sloped areas that are unable to support healthy turf growth can be converted to a mix of perennial herbaceous and woody species
- Still provide adequate ground cover and soil stabilization
- Important to use appropriately selected plants

Rain Barrels

- Used to immediately capture stormwater runoff from roofs and gutter systems
- Captured water can be used for lawn and garden irrigation, car washing, etc
- Must have debris filter and overflow mechanism

Living Shorelines

- Method of stabilizing eroding shorelines using marsh plants and structures known as sills
- Supports water quality improvement by preventing sedimentation and infiltrating pollutants
- Important habitats for aquatic life, especially oysters



Virginia Conservation Assistance Program

Presented by Virginia Association of Soil & Water Conservation Districts

VCAP is an urban cost-share program that provides financial incentives and technical and educational assistance to property owners installing eligible Best Management Practices (BMPs) throughout Virginia. These practices can be installed in areas of your yard where problems like erosion, poor drainage, or poor vegetation occur.

Application Process

1) Contact Robyn Woolsey, CSWCD Urban Conservationist, to discuss what issues need to be addressed and what BMPs might be suitable
2) Site visit with CSWCD Staff to further discuss issues and opportunities to correct them
3) Submit VCAP paperwork after BMP and associated designs have been approved
4) Three step approval process: CSWCD Urban Committee review, CSWCD Board of Directors review, final VCAP Steering Committee review
5) Once approved, construction can begin

FY24 Cost-Share Rates

- Cost-share payments greater than $600 are considered taxable income
- Start-Up Payment Pilot Program: opportunity to receive 50% of cost-share payment prior to beginning construction

Practice	Cost-Share Rate	Maximum Payment
Conservation Landscaping	80% of actual costs	$7,000
Rain Garden	80% of actual costs	$7,000
Dry Well	80% of actual costs	$7,000
Rainwater Harvesting	$4 per gallon of treated volume	$20,000
Impervious Surface Removal	$5 per square foot	$20,000
Permeable Pavement	$14 per square foot	$20,000
Vegetated Stormwater Conveyance	80% of actual costs	$20,000
Constructed Wetland	80% of actual costs	$20,000
Bioretention	80% of actual costs	$30,000
Infiltration	80% of actual costs	$30,000
Green Roof	$20 per square foot	$30,000
Living Shoreline	80% of actual costs	$30,000

BMP Inspections & Lifespan

- Every BMP installed through VCAP includes a 10-year lifespan, which requires the applicant to maintain the BMP for 10 years.
- Periodic inspections are conducted throughout the lifespan
- Procedures exist to address maintenance responsibility if applicant moves or sells the property
- Repayment may be required if BMP is not maintained and loses function

To summarize:

Preventing erosion and managing stormwater is possible! There may not be a perfect solution, but there are always steps we can take to decrease common concerns.

Every little bit counts! Even small conservation efforts implemented locally can have a big impact in the Chesapeake Bay.

Help is available! If you have questions or need guidance, Soil & Water Conservation District staff are here to help, and if we can’t answer your questions, we can probably point you to someone who can.

Questions?

Thank you!

Contact me:

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