Waterwise Landscaping: Protecting the Grand River & Beyond

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What is MSU Extension?

With a presence in every Michigan county, MSU Extension provides tools to live and work better

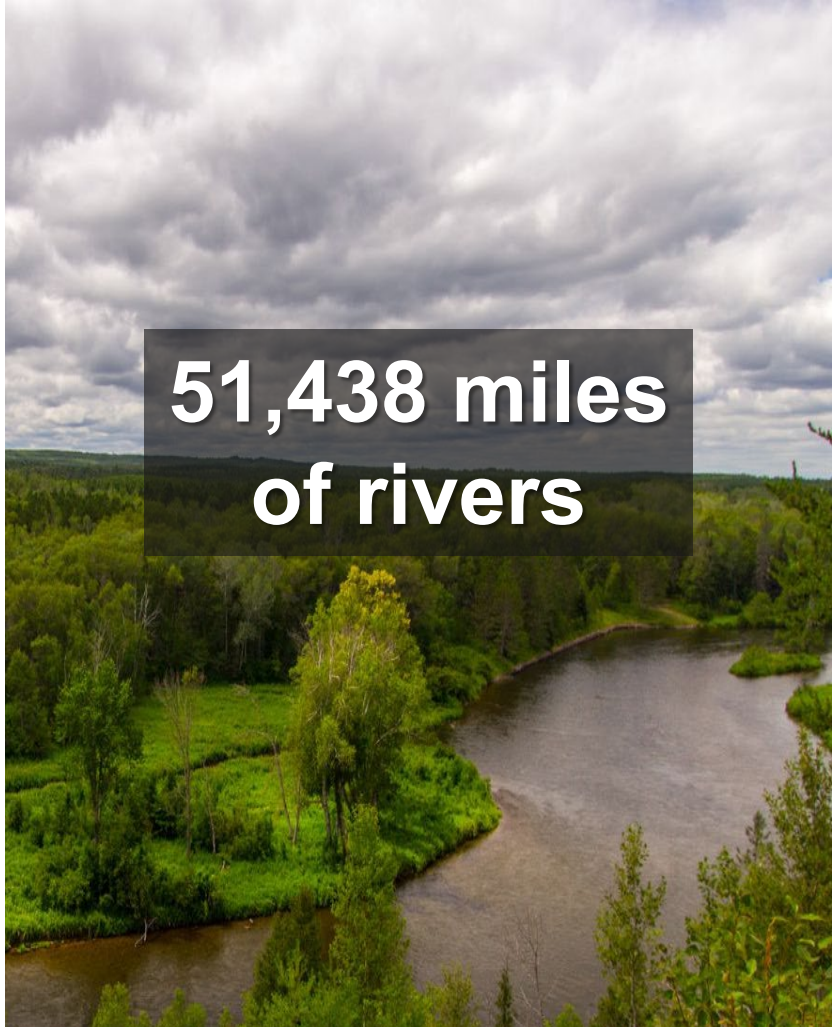
- Agriculture
- 4-H
- Community Planning and Tourism
- Food and Health
- Lawn and Garden
- Natural Resources

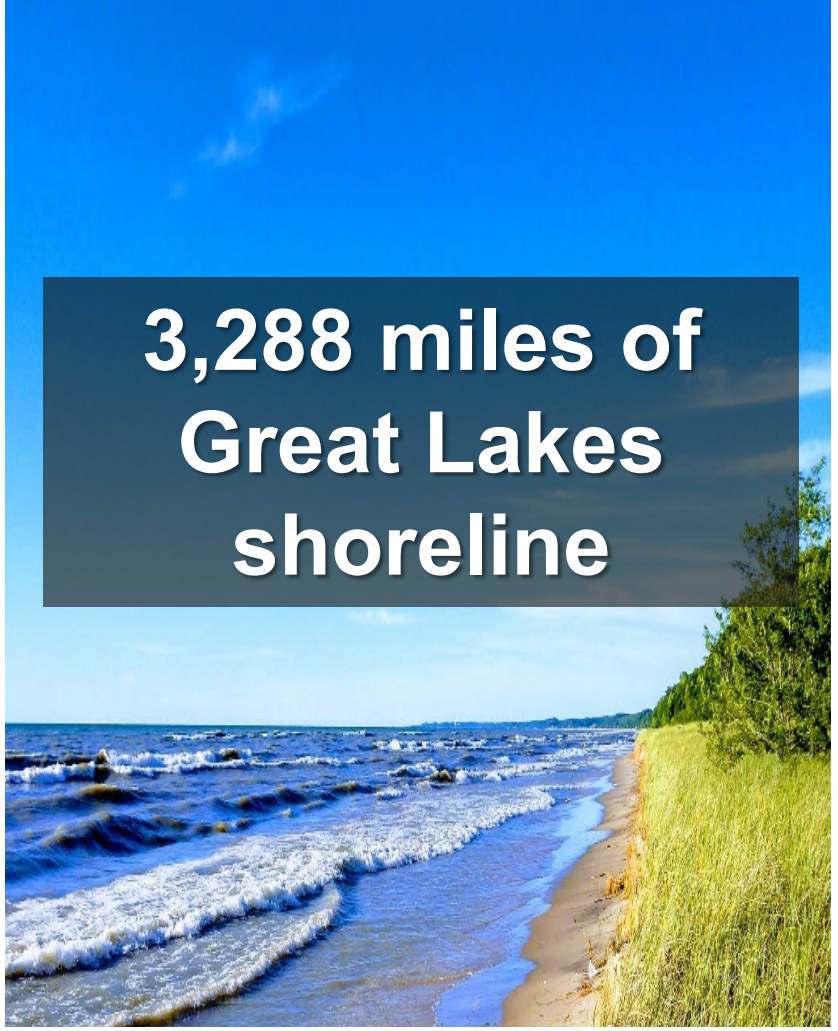
www.msue.msu.edu

MICHIGAN STATE UNIVERSITY | Extension

Today

- Where does your rainwater go?
- Threats to Michigan waterways
- What can we do?
- Where to learn more





You are never more than six miles from a body of water

Ecosystem Services

- Recreation
- Flood protection
- Water supply
- Power production
- Navigation
- Food


154 species


13 species


12 species


66 species


414+ species

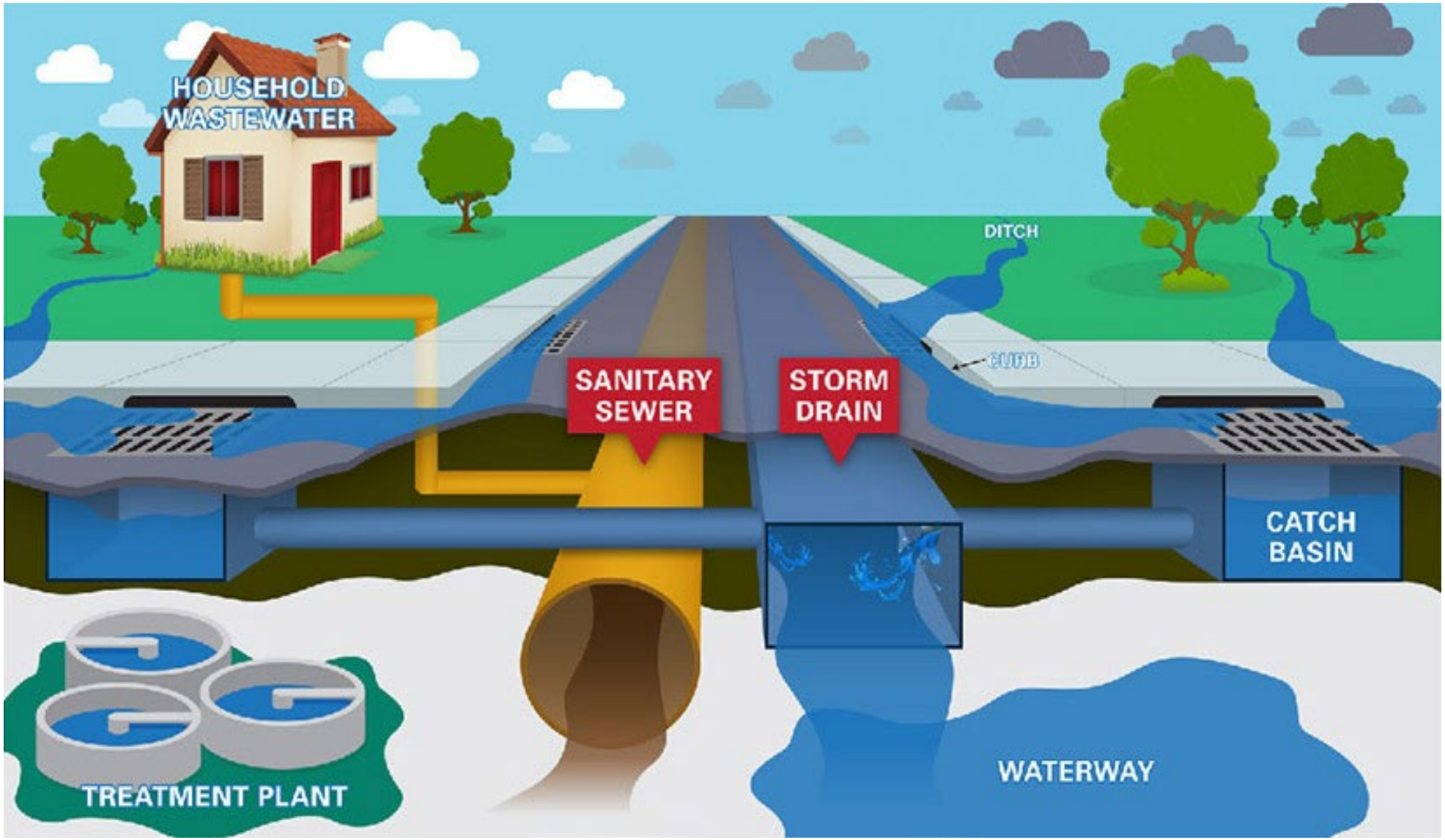
What is one of the **greatest threats** to clean water?

Polluted
runoff


Runoff from Roof
Runoff from Gutters
Runoff from Street
RUNOFF PICKS UP:
• Pet Waste
• Fertilizers
• Motor Oil
• Detergents
• Chemicals
• Litter
STORMWATER RUNOFF CARRIES POLLUTANTS INTO OUR WATERWAYS.
© Heal Our Waterways

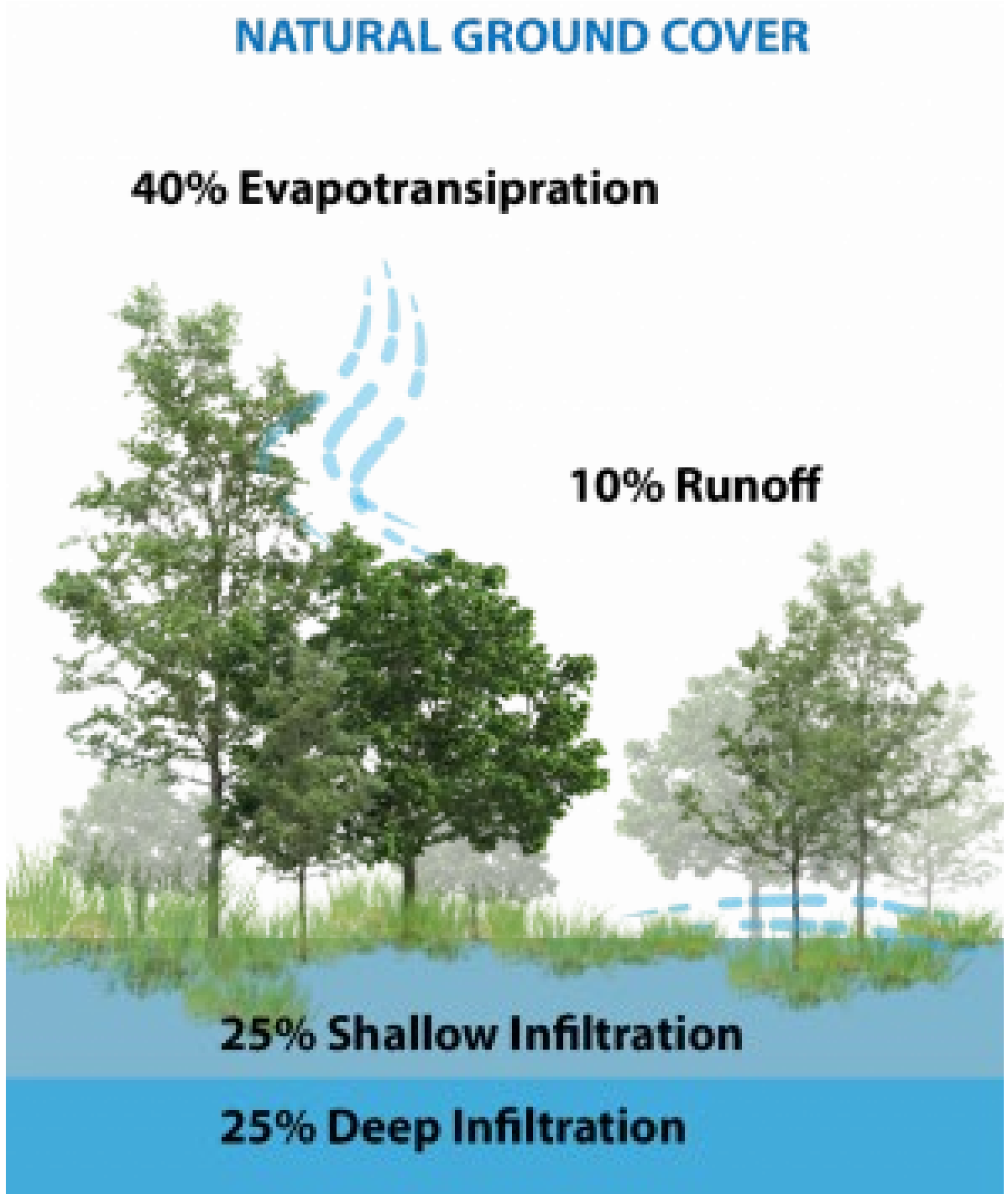
Storm sewers lead to…

Streams


HOUSEHOLD WASTEWATER
DITCH
CURB
SANITARY SEWER
STORM DRAIN
CATCH BASIN
TREATMENT PLANT
WATERWAY

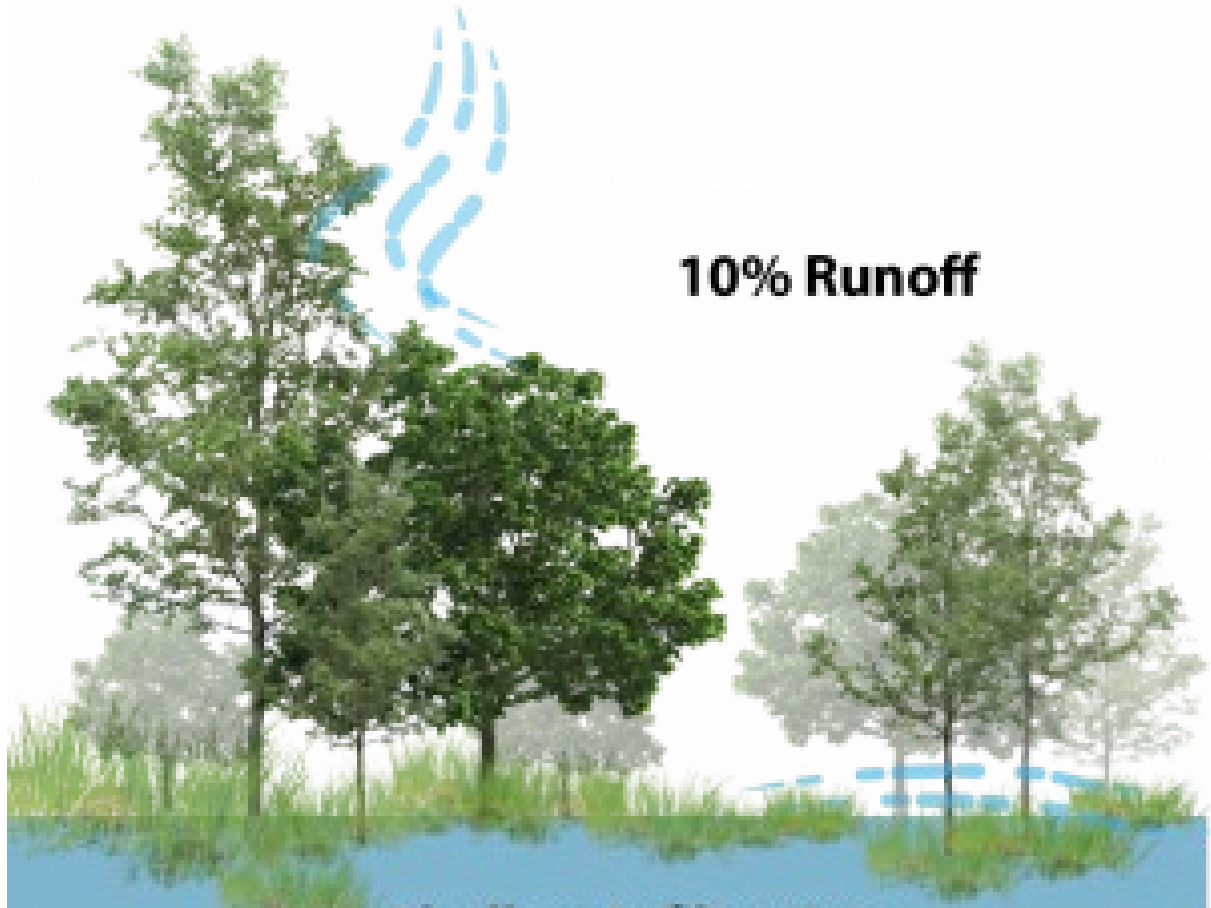
Sediment is the number one water pollutant

NATURAL GROUND COVER



NATURAL GROUND COVER

40% Evapotransipration



10% Runoff

25% Shallow Infiltration

25% Deep Infiltration

IMPERVIOUS COVER (75-100%)

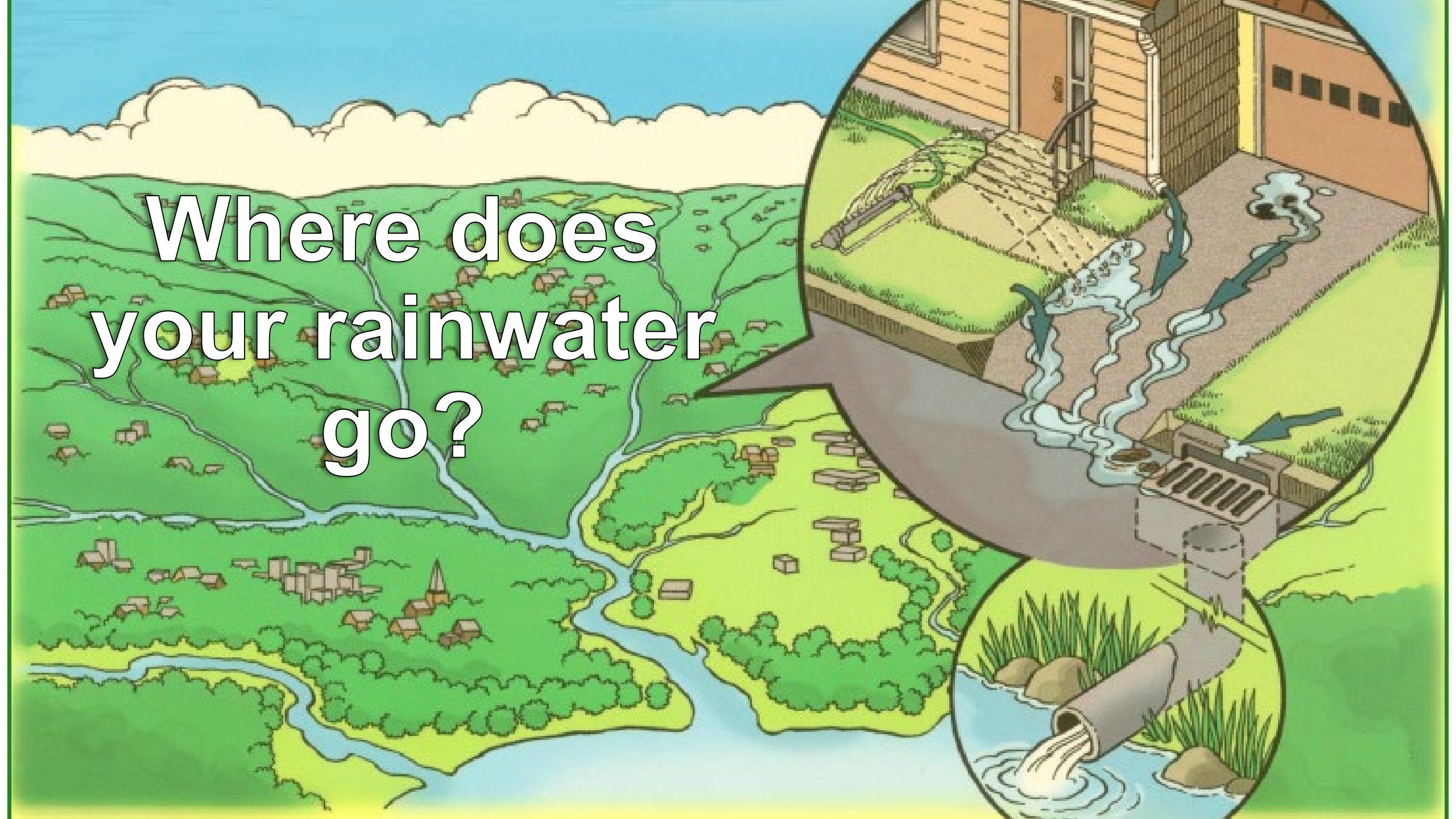
30% Evapotranspiration

55% Runoff

10% Shallow Infiltration

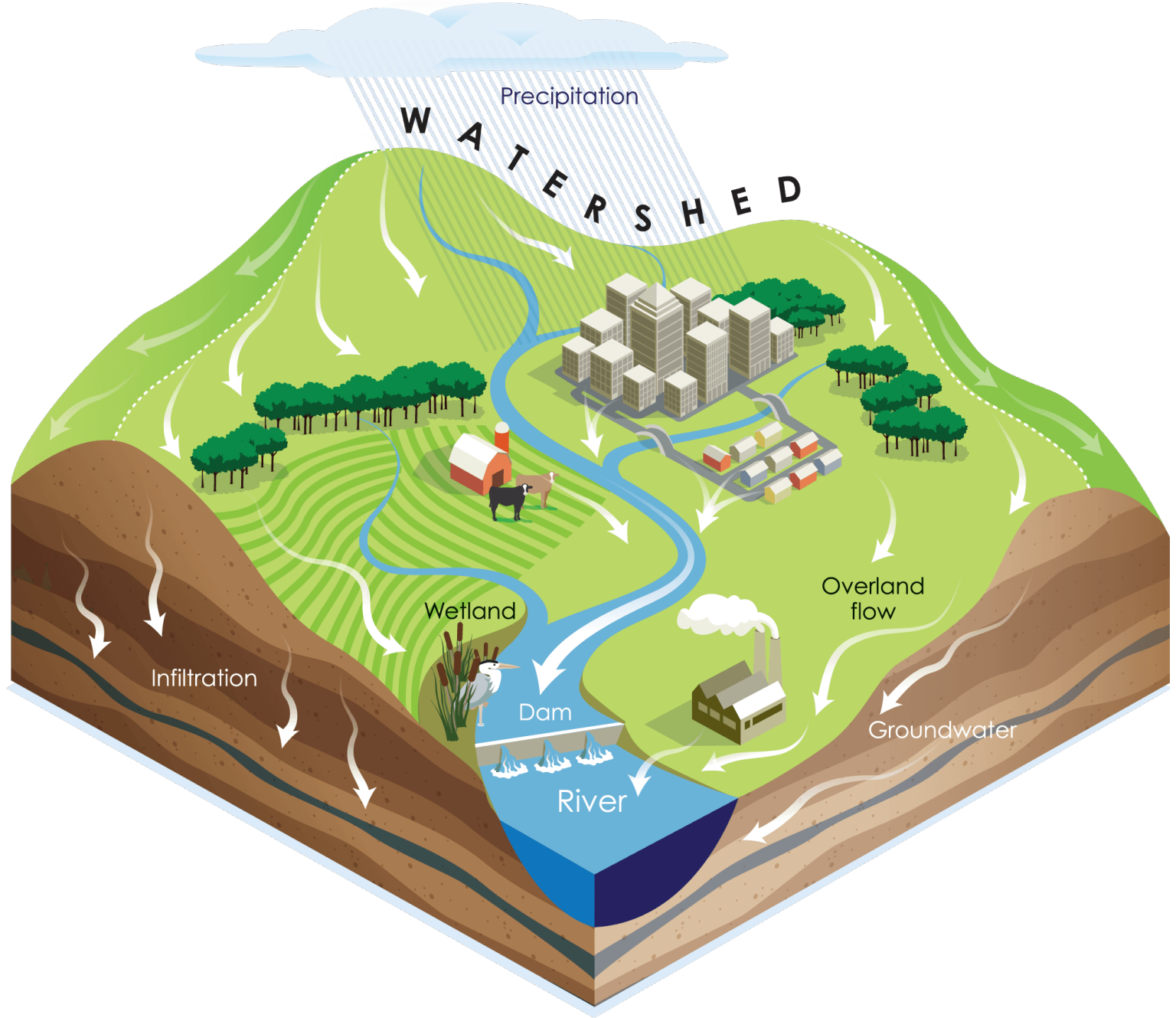
5% Deep Infiltration

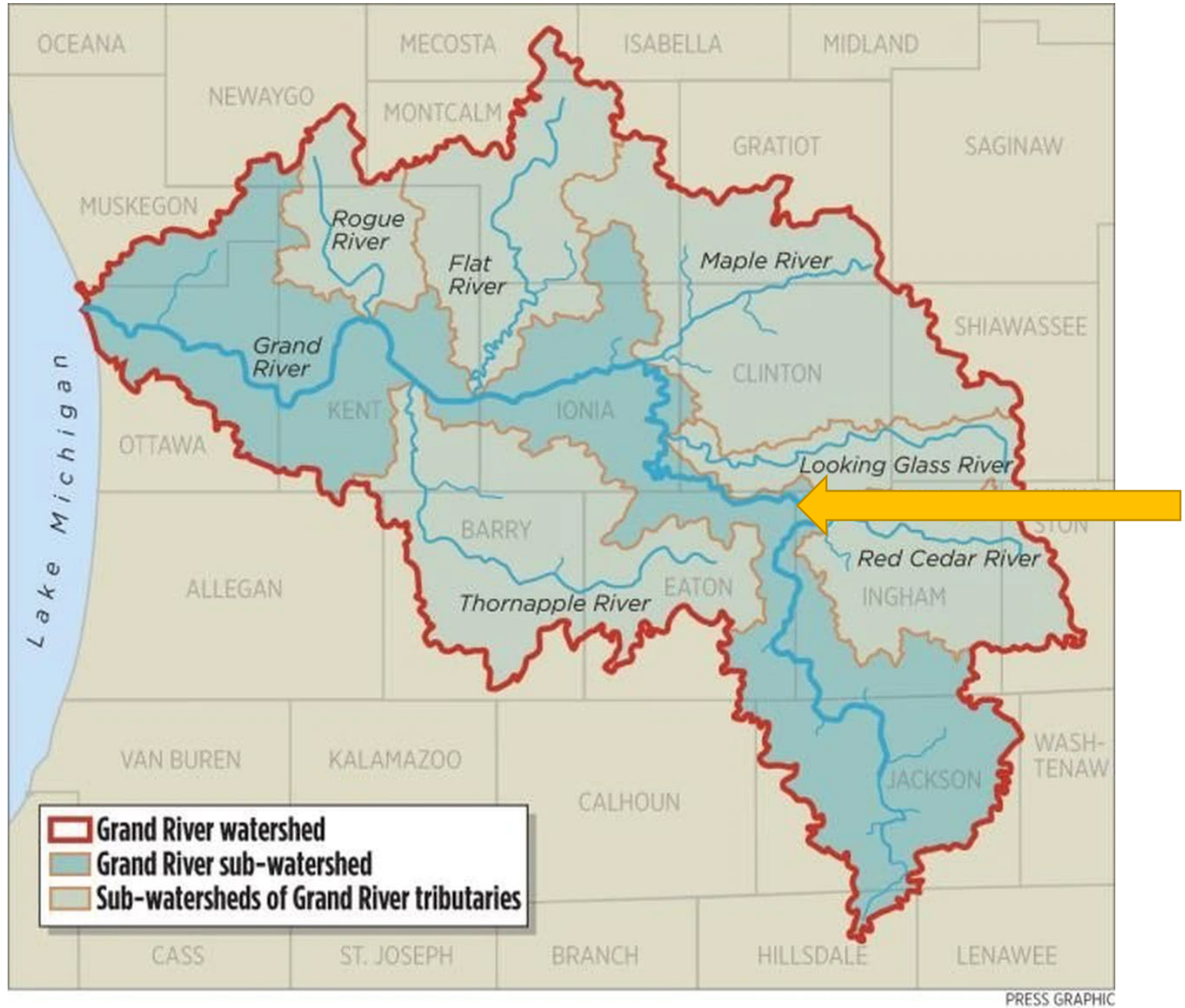
Alabama Cooperative Extension


Where does your rainwater go?

Grand River

- 252 miles - longest river in Michigan
- Headwaters in Livingston County
- Flows into Lake Michigan at Grand Haven
- 5,572 square miles in 18 counties


Precipitation
WATERSHED
Infiltration
Wetland
Dam
River
Overland flow
Groundwater


OCEANA
MECOSTA
ISABELLA
MIDLAND
NEWAYGO
MONTCALM
GRATIOT
SAGINAW
MUSKEGON
Rogue River
Flat River
Maple River
Grand River
SHIAWASSEE
CLINTON
KENT
IONIA
OTTAWA
Looking Glass River
BARRY
Red Cedar River
ALLEGAN
EATON
INGHAM
Thornapple River
Lake Michigan
VAN BUREN
KALAMAZOO
WASH-TENAW
JACKSON
CALHOUN
Grand River watershed
Grand River sub-watershed
Sub-watersheds of Grand River tributaries
CASS
ST. JOSEPH
BRANCH
HILLSDALE
LENAWEE
PRESS GRAPHIC

Water Quality Concerns

- Excessive runoff and sediment
- Nutrients
- Bacteria

What can you do?

Slow it. Spread it. Sink it.

- Practices that allow water to soak into the ground
- Use natural systems to promote infiltration


Roof runoff
Erosion
Chemical applications
Driveway runoff
Gutters
Compacted soils

For every **1 inch of rain** that falls on a 1,000 square foot roof, **600 gallons of rainwater** exit the gutter.

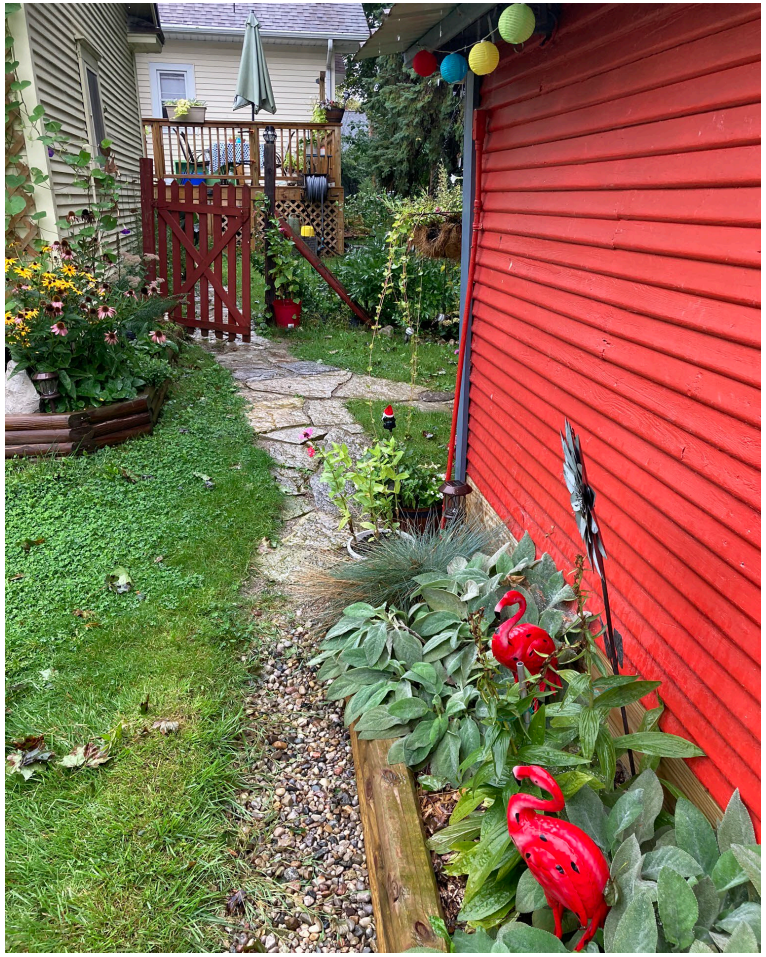
Redirect Downspouts

Direct and spread-out rainwater to areas that can soak it in.

Rain Barrels

- Take up very little space
- Inexpensive
- Easy to install
- Conserve water and reduce runoff
- Hint: Use gravity to your advantage

Roof Driplines



- Used on structures without gutters
- Soaks in water where it lands
- Reduces mud on siding

Soften Hardscapes

Sidewalks, driveways, and patios spaces can become areas that allow water to sink in rather than runoff.

Rain Gardens

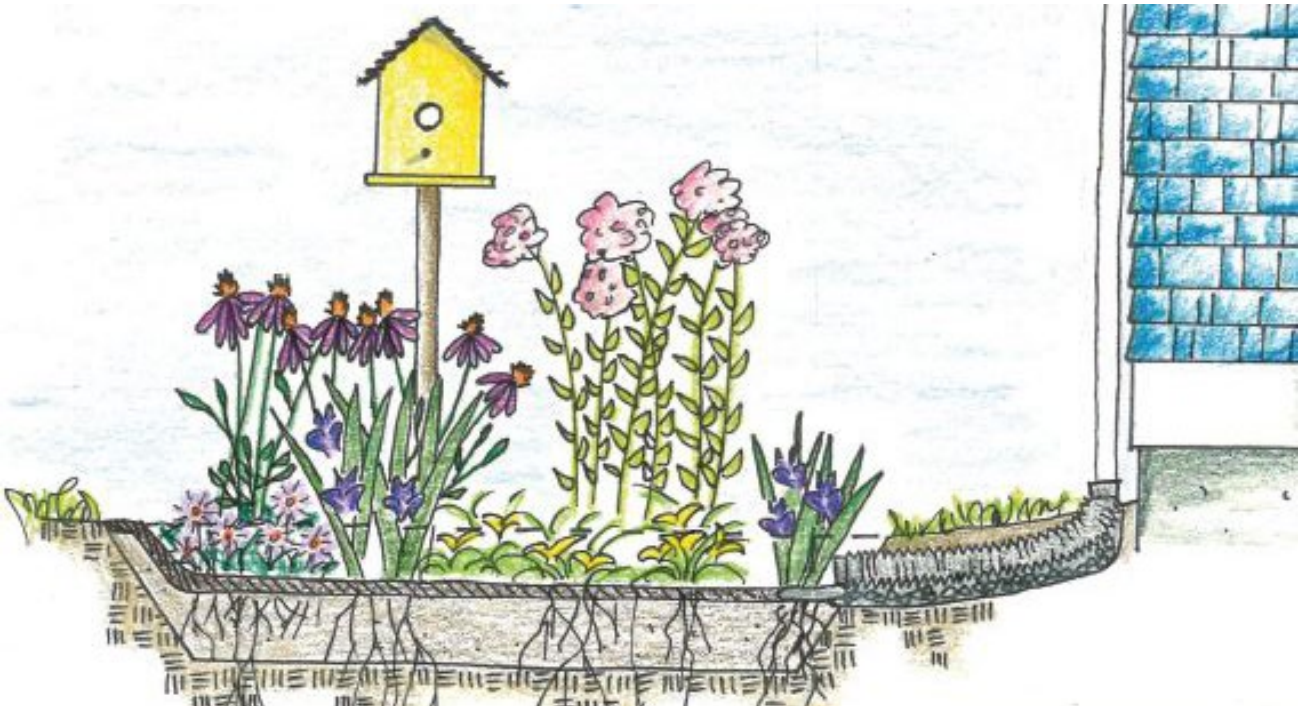
- Slows the rush of water
- Mimic the hydrologic action of a healthy forest
- Naturally filters nitrogen and phosphorus and overall sediment with native plants and porous soil
- Provides habitat

Place it where it flows

- Sunny areas that do not have ponding work best
- Biggest impact is near hard surfaces: along driveways or at the end of gutters
- Direct water via stone channels from a downspout or extender into the garden bed.

Three Main Components

1. Shallow basin: usually about six inches deep, large enough to accommodate the runoff
2. Inlet: Guides water from the source toward the basin (a dry stream bed of stone or coarse gravel, downspout)
3. Berm: farthest or lowest end from the water source used to hold water



Design Considerations

- Bowl or saucer shaped (4-8 inches deep)
- Place > 10 feet away from buildings
- Avoid high water table areas
- Maintenance! Mulching, weeding, and replacing plants that fail to thrive.

Use native plants

- Increase biodiversity (pollinators, beneficial insects, animals)
- Deep root system aids in water infiltration
- Tolerate short periods of standing water and can deal with drought conditions
- Purchase established plants since seeds can easily be washed away

www.canr.msu.edu/nativeplants


Purple coneflower


Wild geranium


Blazing star


Black-eyed susan


New England aster

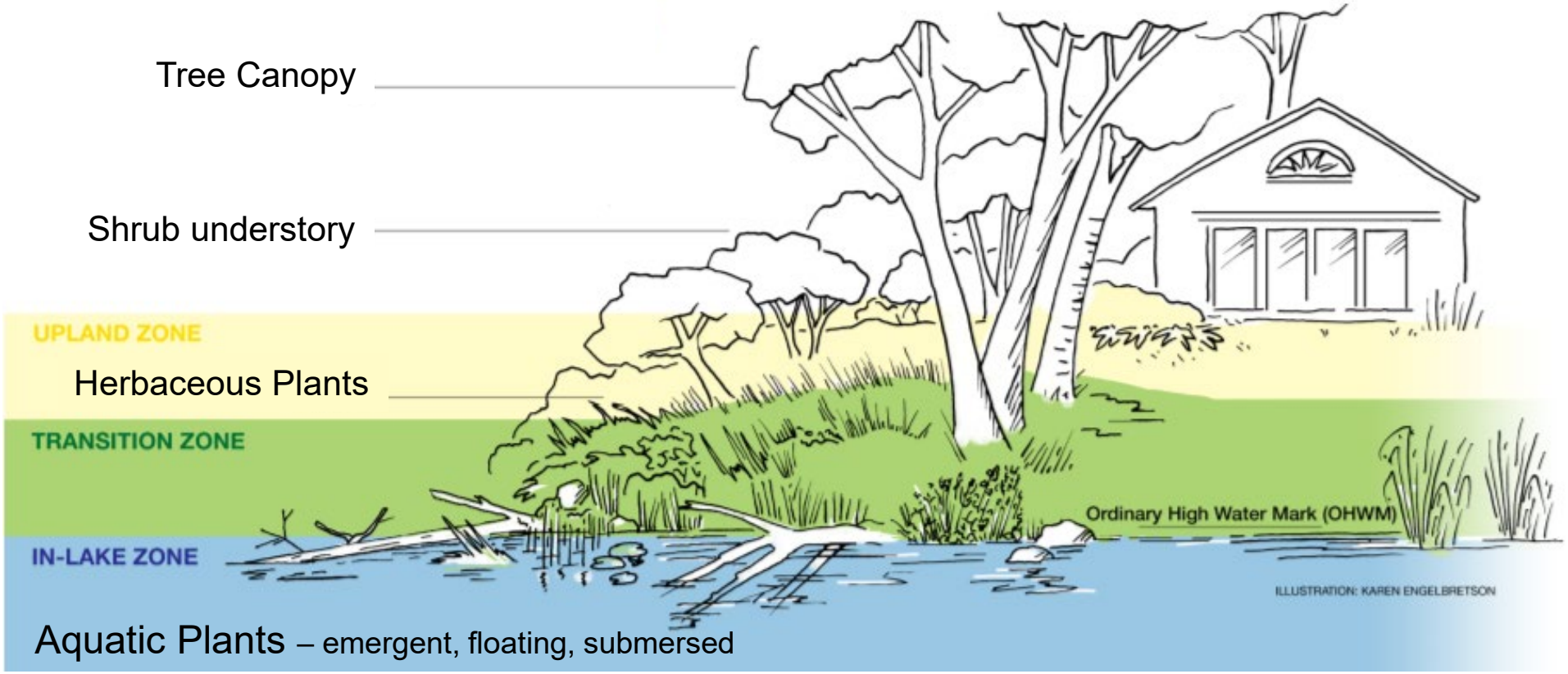
Live near water?

- Don’t mow to the edge
- Little to no value for wildlife
- No buffer between nutrients and the water
- Say hello to geese

Landscaping Near Water

Three Tiers of Vegetation

- Stabilize banks & waterbody sediments
- Absorb nutrients & pollution
- Provide habitat
- Provide shade



Modified from Wisconsin Healthy Lakes

Integrating water into your landscape

Water Gardens

- Add peace and serenity to landscapes
- Provides habitat for frogs, toads, turtles and birds
- Go native!

BUYER BEWARE

- Non-native
- High reproductive rate
- Environmentally hardy
- Hitchhikers

Michigan's Aquatic Invasive Species Watch List

European water clover

Water lettuce

Water hyacinth

mi.gov/invasives

RIPPLE
REDUCE INVASIVE
PET & PLANT ESCAPES

Don't let it loose!

- Connect with a local retailer
- Contact animal rescue groups and hobbyist clubs
- Veterinarians can provide euthanasia options

WHAT CAN GARDENERS DO?

Graphic from Michigan Shoreline Stewards Program


Learn
more!

Have a home gardening question?

Ask Extension!

- Via 1-888-678-3464 or email
- Questions related to lawns, gardening, agriculture, food safety, food preservation, natural resources and more

www.migarden.msu.edu

Smart Gardening

Earth-friendly campaign to help gardeners make smart choices in their backyards.

- Toolkit of research-based knowledge
- Free factsheets and videos
- Plants, fruit, vegetables, lawns, pollinators and shorelands

SMART GARDENING FOR SHORELANDS

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Soak up the rain with a smart rain garden

Paige Filice, Michigan State University Extension

Beautify your yard and neighborhood while helping the environment with a rain garden. Rain gardens are a unique landscaping practice used to filter and absorb rainwater that runs off roofs and driveways, allowing it to be slowly reintroduced into our water system. They help the environment by keeping pollution out of storm drains and instead filter it naturally through the soil. Often planted with deep rooted and lush native plants, rain gardens are also an excellent way to attract birds and butterflies to your yard.

Native plants: Butterfly milkweed, purple coneflower and golden alexanders. This lakeside rain garden includes rocks with native plants.

Rain gardens capture and absorb water within a day or two of a rain event and are dry most of the year. They are designed to direct water from gutters or high parts of your yard into shallow depressed garden areas planted with native species. Rain gardens can be a very affordable and attractive option for those interested in protecting water and enhancing their landscape. When considering a rain garden, there are a few factors to keep in mind.

Place it where the water flows

A rain garden should be installed where it can collect the most rainwater runoff as possible, likely near driveways and downspouts. Capturing rainwater from rooftops is simple if your house has gutters. Depending on the shape of your yard, you can build a stone channel from a downspout or bury a 4-inch plastic downspout extender into the garden bed. The shape and depth of a rain garden can be a natural depression in your landscape or one you create.

While it may be tempting to locate a rain garden in a low, wet spot in your yard, do not place it where water is currently ponding. Standing water indicates soil that is slow to absorb water and the function of a rain garden is to assist with water infiltration. Place rain gardens at least 10 feet away from buildings to prevent water seeping into building. Do not place a rain garden over a septic tank, le field or drinking water well.

Rain gardens should be as lev as possible. Water should not pool at one end or spill over an edge before it has a chance to soak in. Constructing a rain garden on level ground will also make it easier to install since you won't need to remove as much soil.

Big or small, every little bit helps

Rain gardens are usually a few inches deep (4-8 inches) and can be designed in any shape or size. Generally crescent, kidney and teardrop shapes work well. Typical rain gardens are 100 to 300 square feet. The size and depth depend on soil type. Gardens placed in sandy, well-draining soil can be much deeper than rain gardens in less permeable clay soil. Depending on the soil type, it may be necessary to replace some soil with an absorbent soil mix to help with water infiltration.

Generally, rain gardens should be about twice as long as they are wide, and the length of the garden perpendicular to where water is entering. During an average rainfall, most of the garden should fill with water and infiltrate within a day.

Rain gardens can be placed anywhere but are most efficient near driveways and other hard surfaces that don't allow rainwater to filter through them.

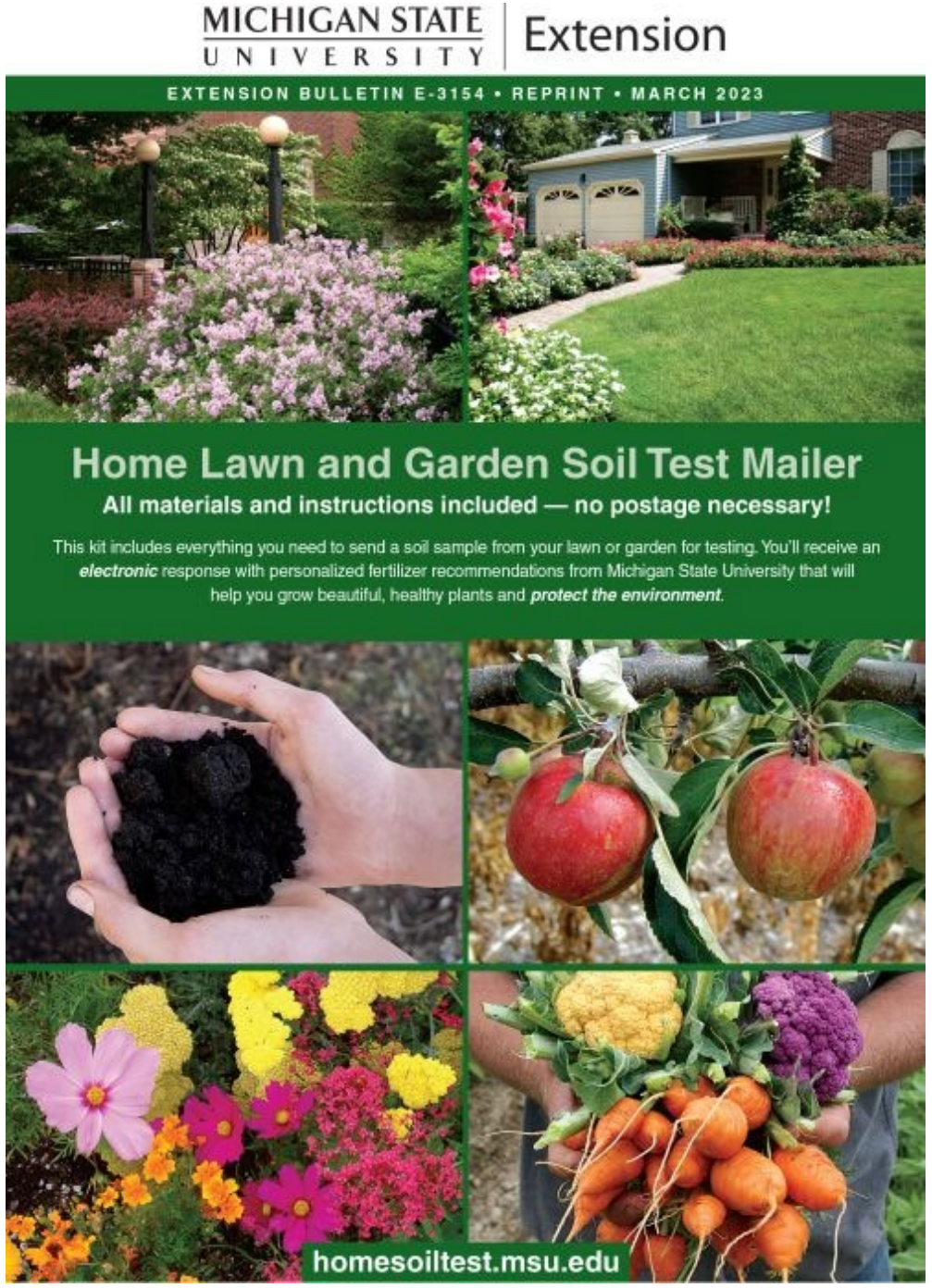
Smart Gardening

Smart Gardening

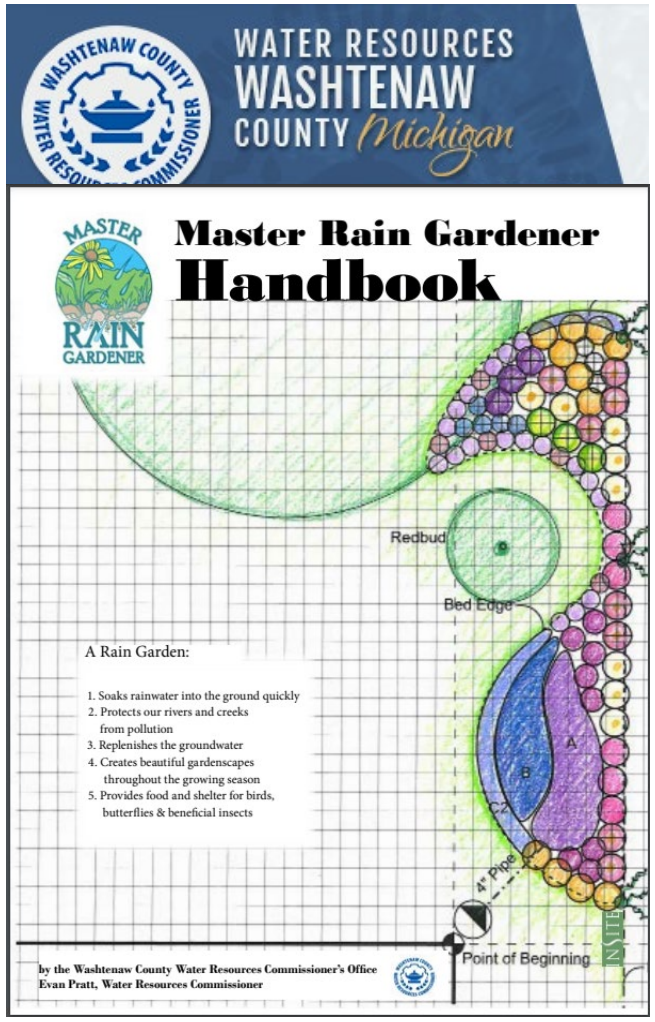
www.migarden.msu.edu

Don’t Guess, Soil Test

- Plants need the correct pH and balance of nutrients to be healthy.
- Protects against over-application of nutrients.
- For lawns, trees, shrubs, flowers, vegetables and fruits.
- Soil should be tested every 2-3 years.
- Available at MSU Extension offices and online: shop.msu.edu



Master Rain Gardener Class



MASTER RAIN GARDENER

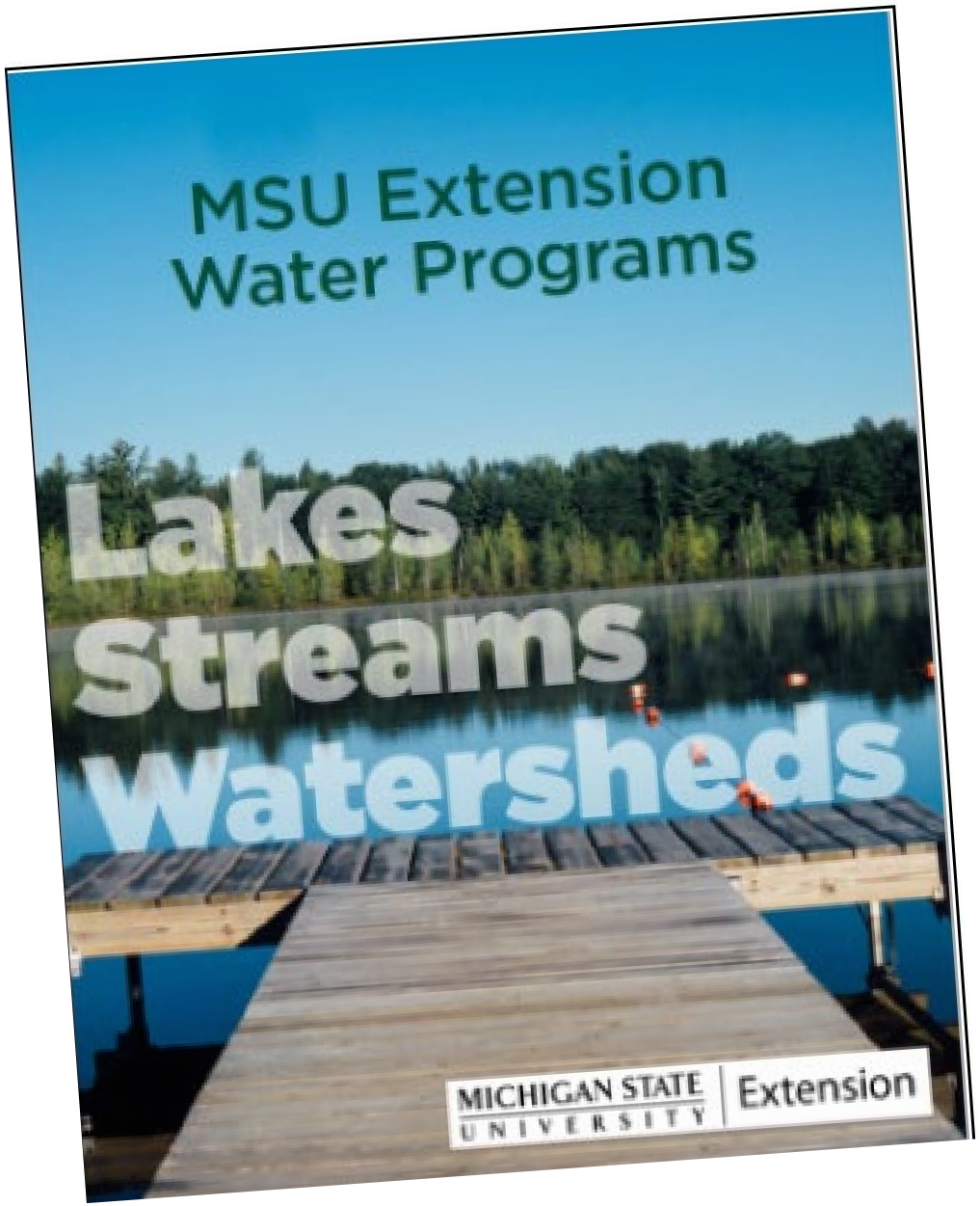
www.washtenaw.org/675/Master-Rain-Gardener-Class

Rain Gardens:

A Guide for Homeowners and Landscapers

Wisconsin Department of Natural Resources

bit.ly/WIraingardenmanual



Learn more about MSU Extension Lake, Stream and Watershed education opportunities

www.canr.msu.edu/watercatalog

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Center for Lakes and Streams

canr.msu.edu/cls

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