Stormwater at Illinois

NRES 285 Student iCAP Ambassadors

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UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

Sea Grant
ILLINOIS-INDIANA

Topics

- Stormwater basics
- Green Infrastructure/resilient landscapes
- Campus demonstration rain garden

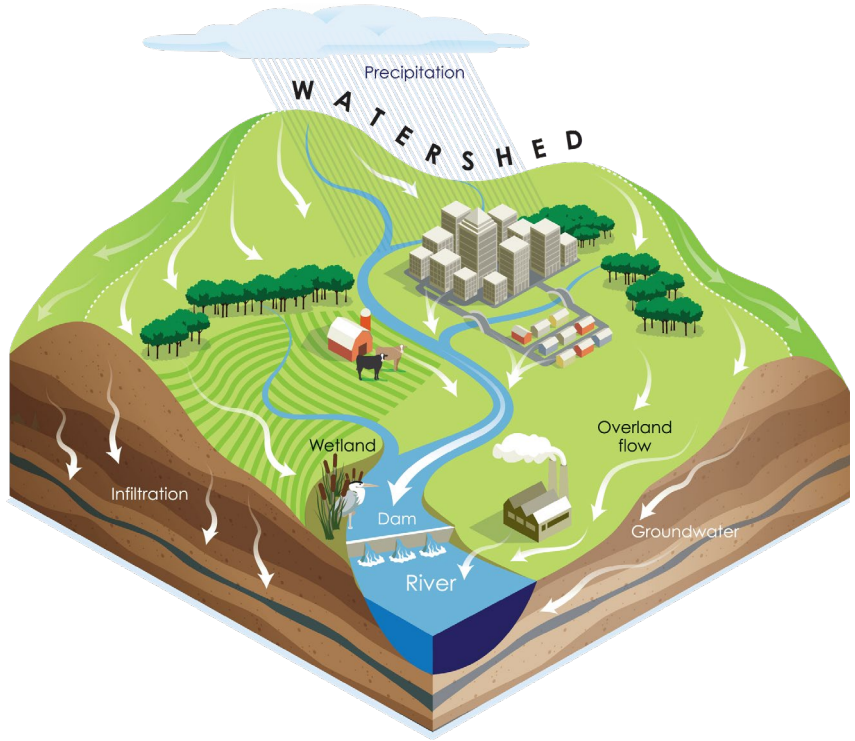
Stormwater: the basics

What is a watershed?

Land area above a given point on a waterbody (river, stream, lake, wetland) that contributes overland flow or surface runoff to it.

Most of campus runoff goes to Boneyard Creek.

It's important to know what your land use practices are impacting.



Source: Lake County Stormwater Management
https://www.lakecountyil.gov/2375/Watersheds

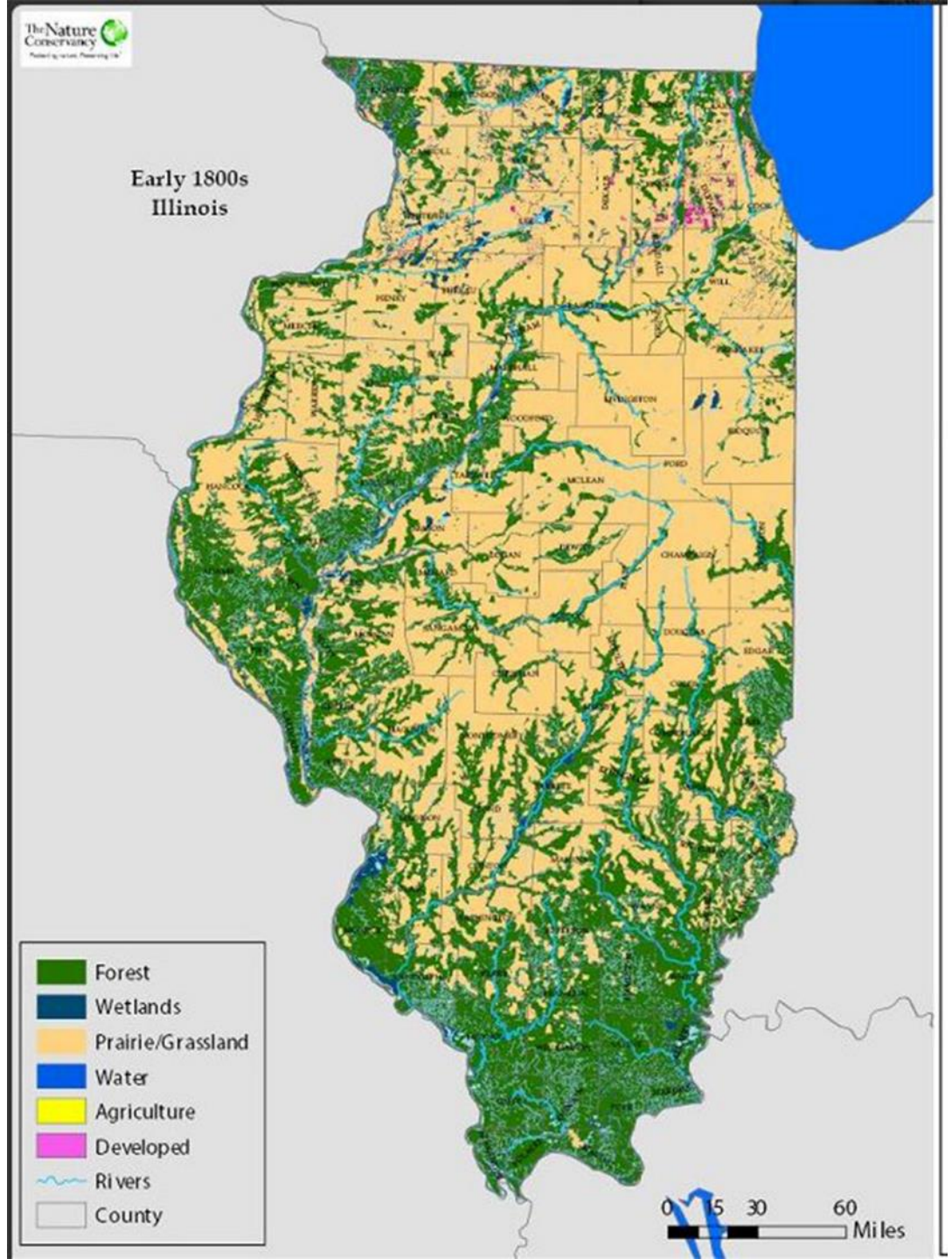
Stormwater: the basics

What is a stormwater?
Rainwater or snowmelt that runs off across the land instead of soaking into the ground.
Can pick up pollutants (sediment, nutrients, metals) as it runs across surfaces.

Stormwater: the basics

What are impermeable surfaces? Solid surfaces that don't allow water to penetrate, forcing it to run off. (roofs, roads, concrete, etc)

Permeable surfaces allow water to percolate into the soil to filter out pollutants and recharge the water table. (vegetation, green infrastructure, etc)


The Nature Conservancy
Early 1800s
Illinois
Forest
Wetlands
Prairie/Grassland
Water
Agriculture
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Rivers
County
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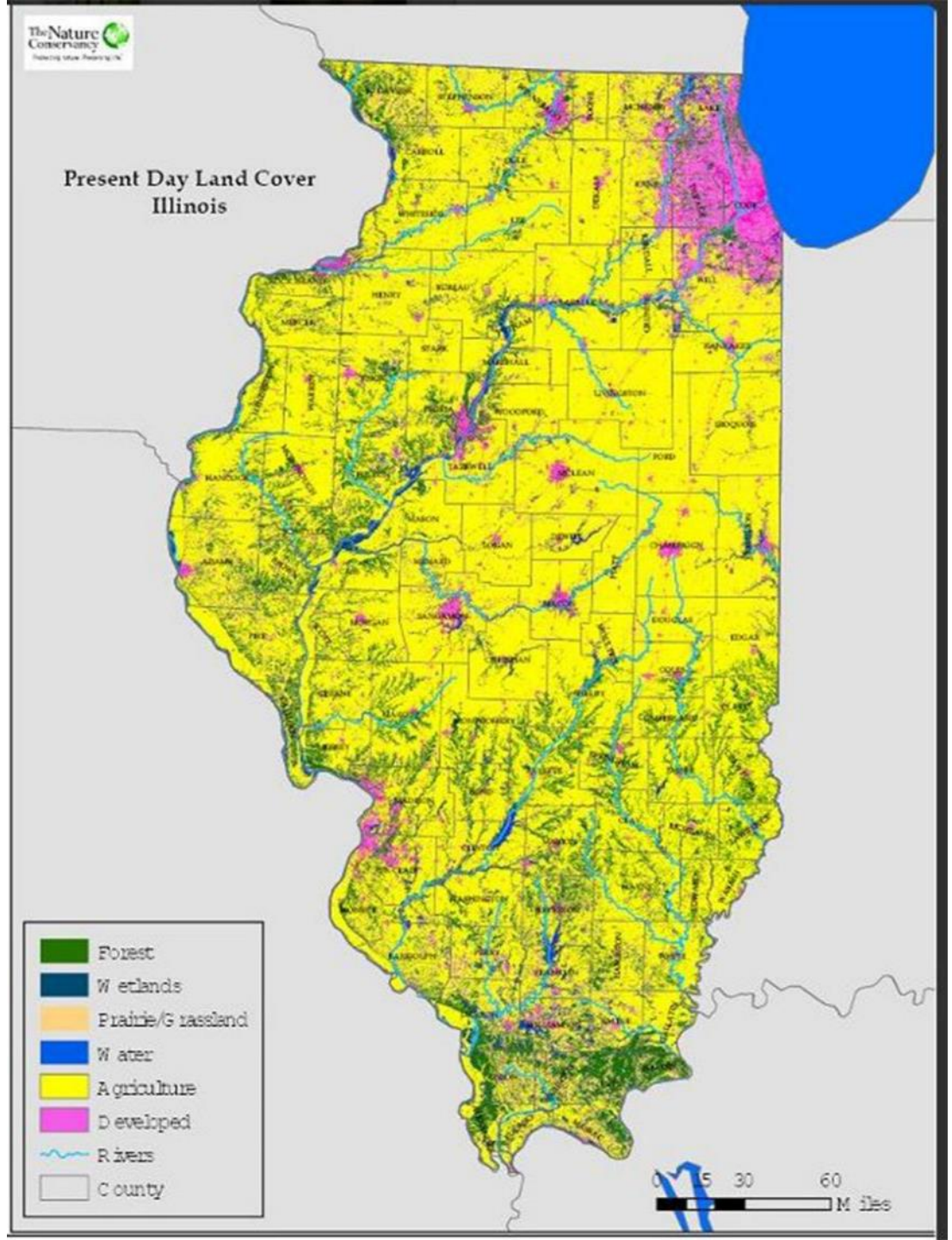
The Nature Conservancy
Present Day Land Cover
Illinois
Forest
Wetlands
Prairie/Grassland
Water
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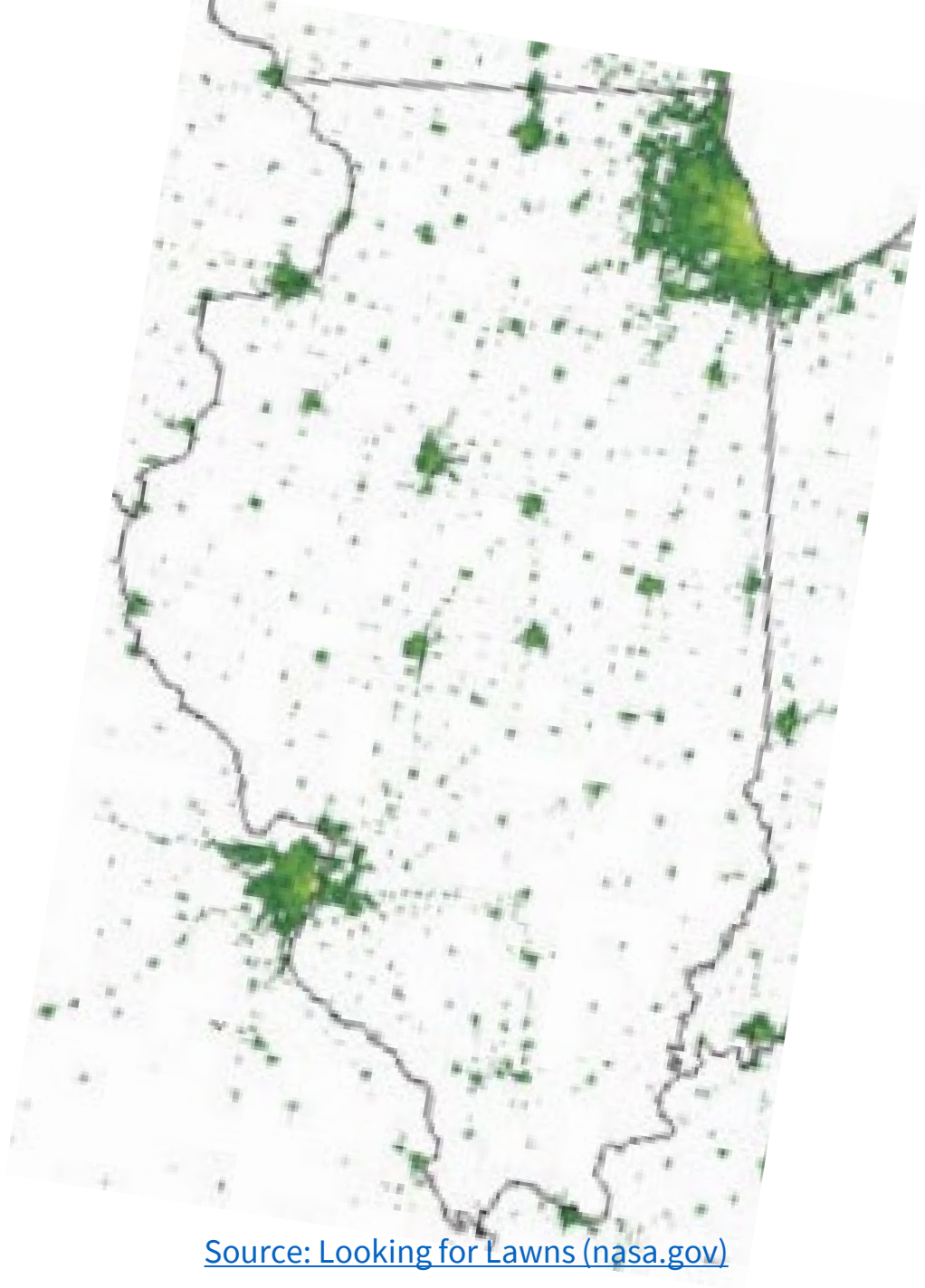
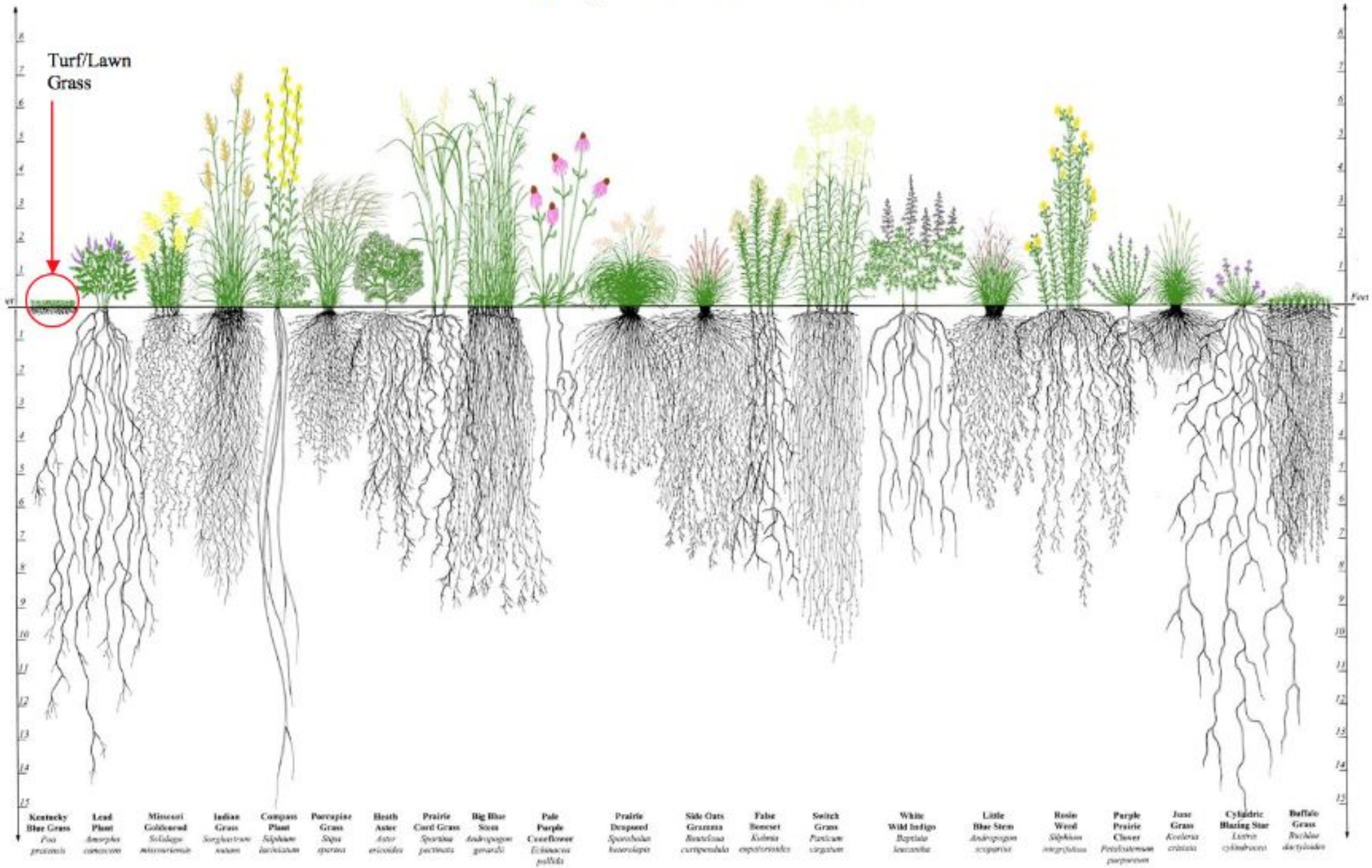
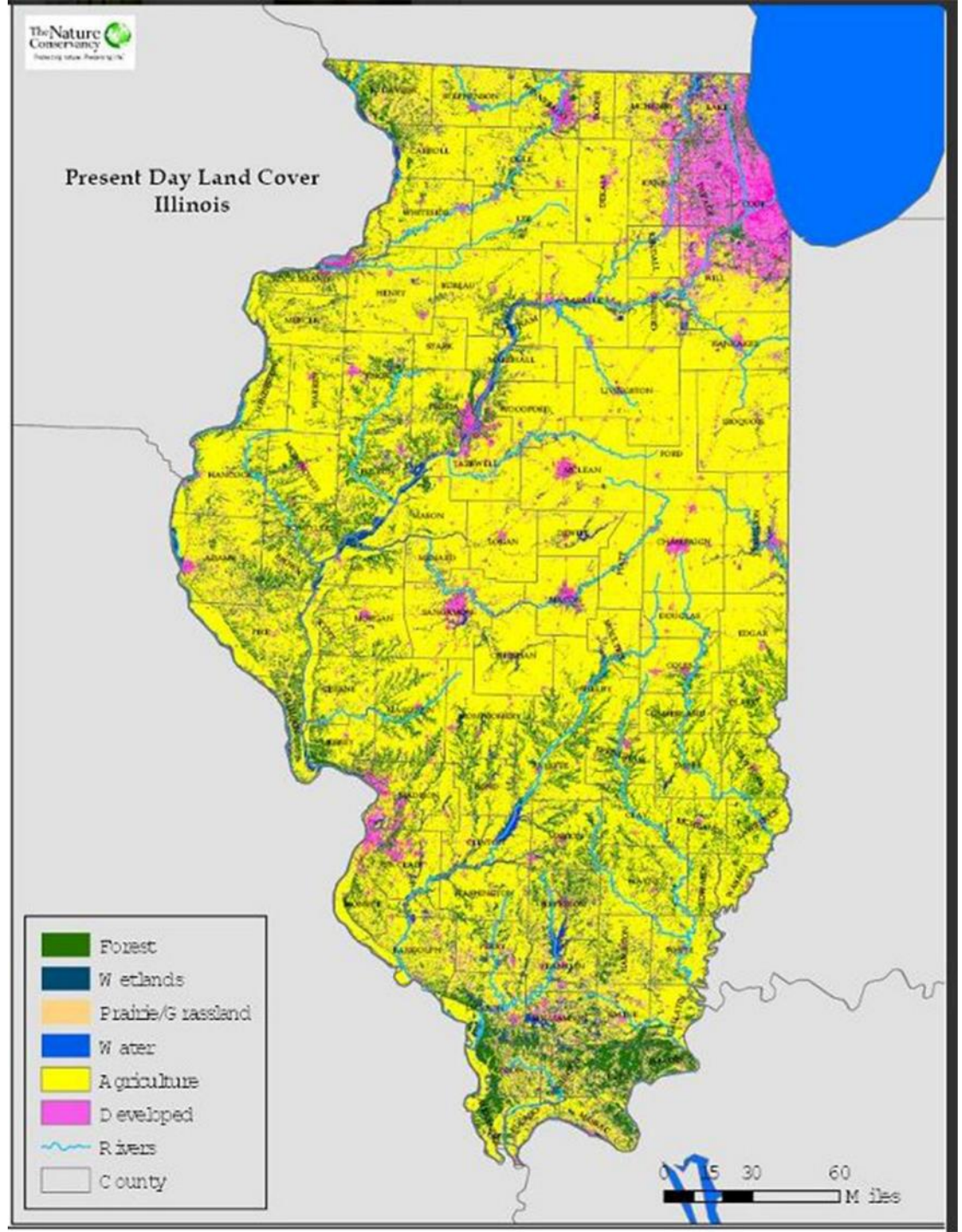


Source: Looking for Lawns (nasa.gov)

Root Systems of Native Plants

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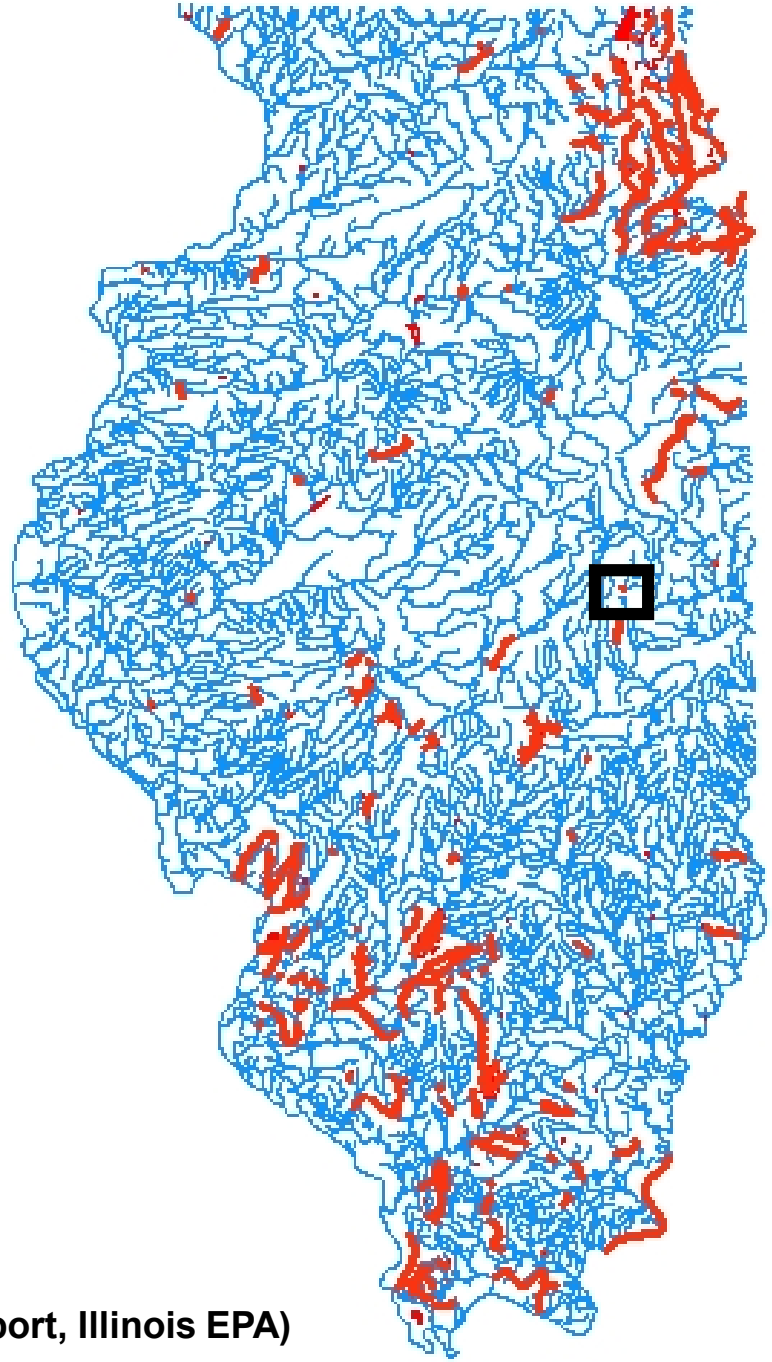
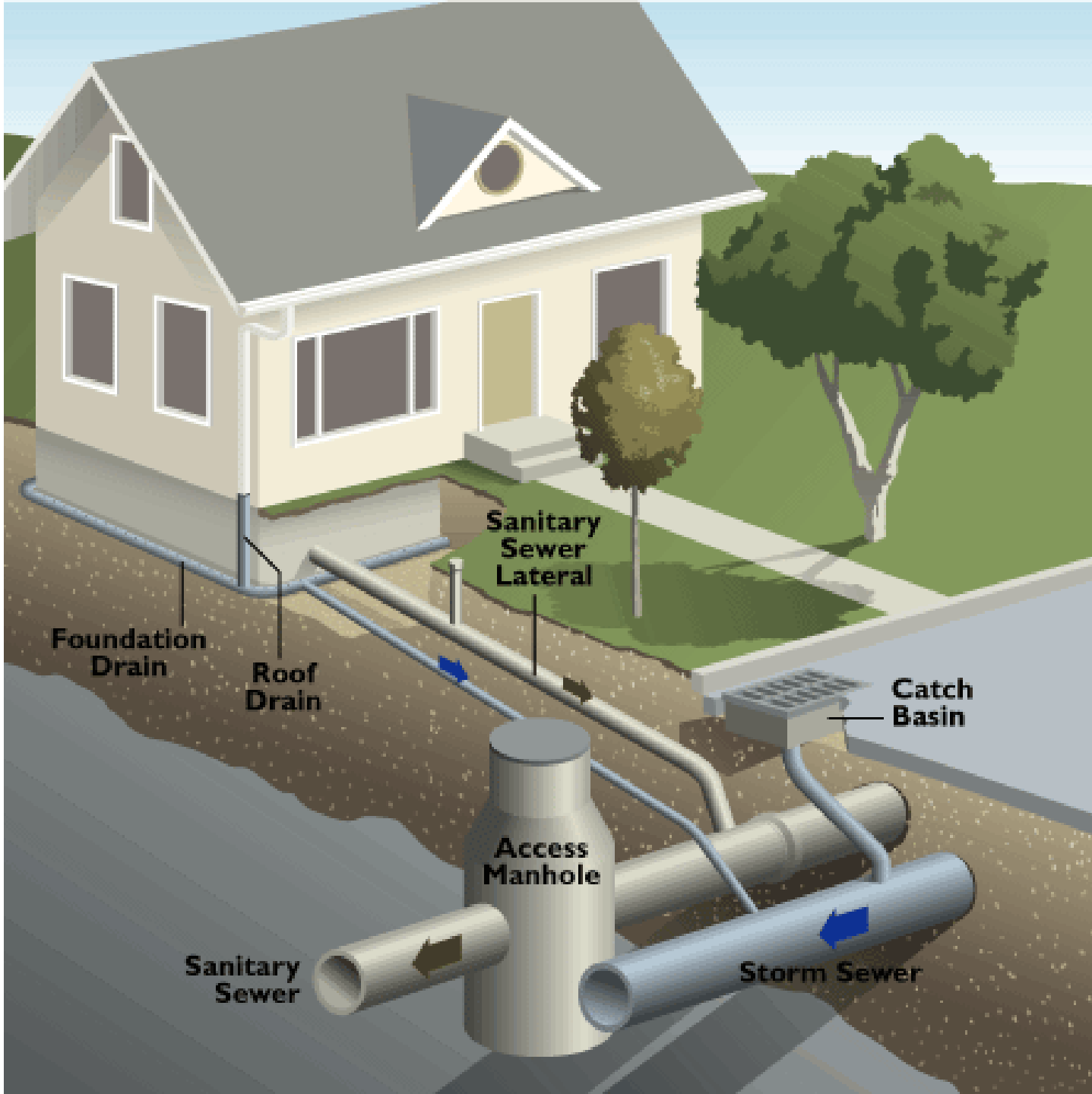


1,262 miles of streams
and 40,037 acres of lakes

(Illinois Integrated Water Quality Report, Illinois EPA)

What are Storm Sewers?
Pipes built to carry away excess rainwater and snowmelt to lakes to rivers.

What are Sanitary Sewers?
Pipes built to transport wastewater to the treatment plant, where it is cleaned before discharge to lakes and rivers.



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Source: Kaleena Menke
Metropolitan St. Louis Sewer District

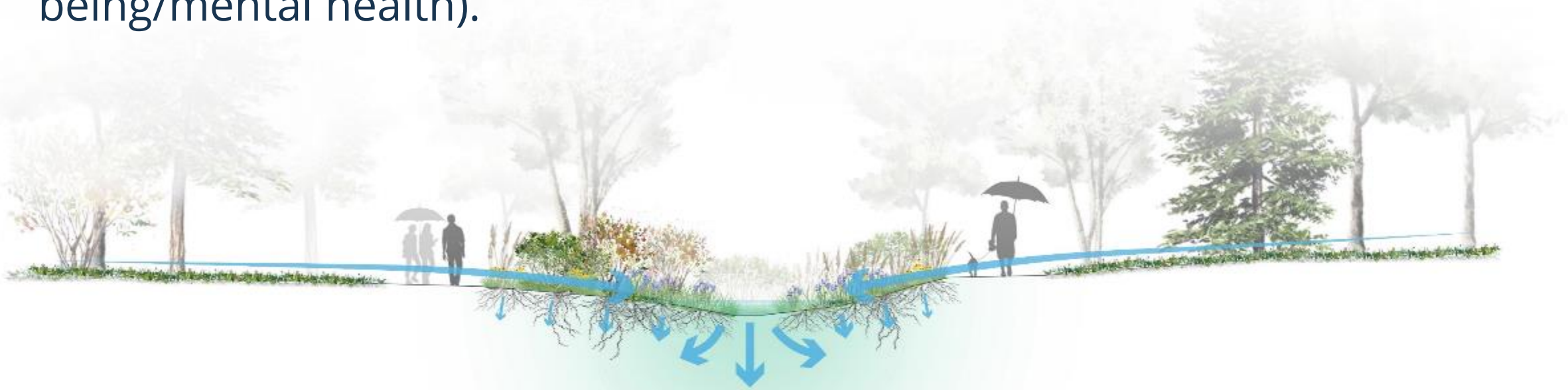
Green infrastructure/resilient landscapes

- **Bioinfiltration cells/Rain Gardens/Bioswales**
- **Permeable Pavement**
- **Green Roofs**
- **Cisterns**

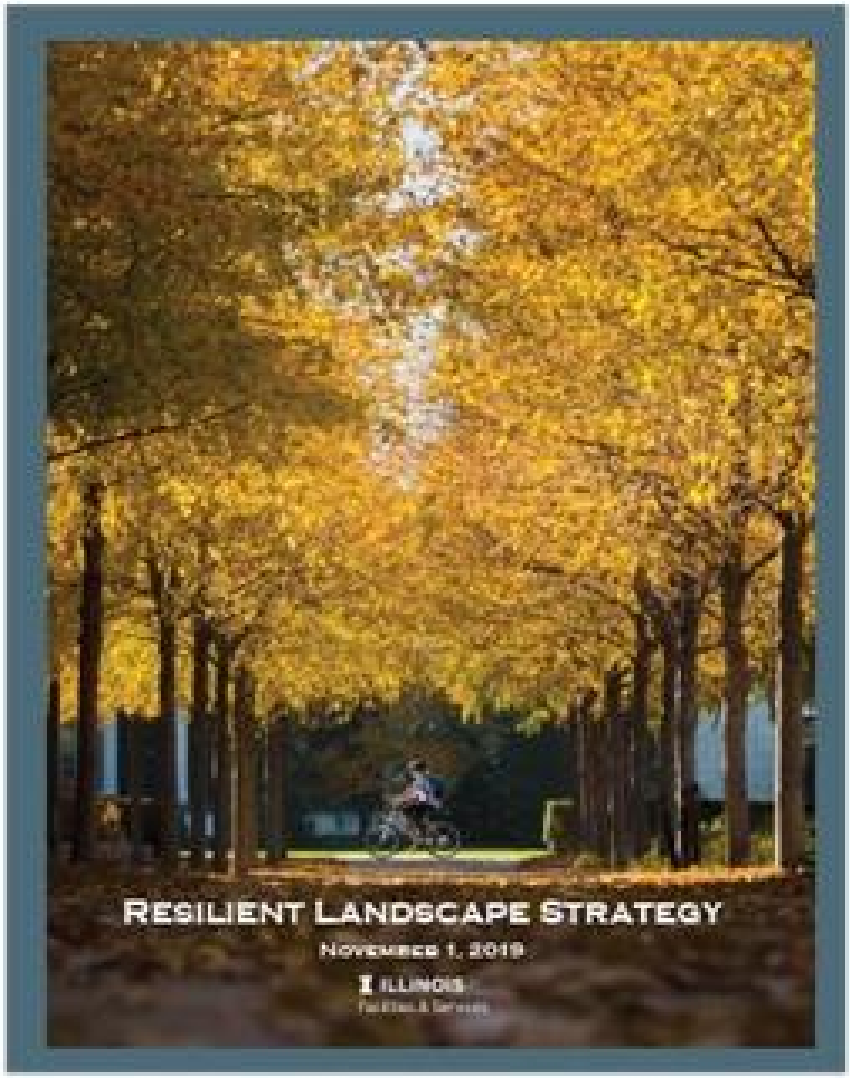
Mimics ecological functions of a natural landscape (e.g. slowing down water's path to lakes and rivers and infiltrating it into the ground).

What is a Rain Garden?

Shallow basin that captures stormwater runoff.
Captures and infiltrates stormwater, helping to mitigate flooding and improve water quality.
Co-benefits include support for pollinators (nectar) and people (well-being/mental health).



iCAP Key Objective: 4.2 Implement Resilient Landscape Strategy



Read the section on “Exemplary Rainwater Management”

Green infrastructure/resilient landscapes

As you talk with facility liaisons, think of places where green infrastructure would be appropriate.

For Rain Gardens, generally avoid:

× Areas above underground utilities
× Areas where water ponds or floods, which may have poor natural drainage (can be remedied via engineered soil)
× Areas under tree canopies (can be ok, if arborists are consulted)

Campus Landscape Architect Brent Lewis is a great resource.

RED OAK RAIN GARDEN

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RORG TEAM

Eliana Brown
Director, Master Gardener Lead

Kate Gardiner
Comm. Manager

Layne Knoche
Landscape Designer

Karen Folk
Master Naturalist Lead

Eric Green
Project Manager

Tony Heath
Project Engineer

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Location image: Google Earth

Location image: Google Earth

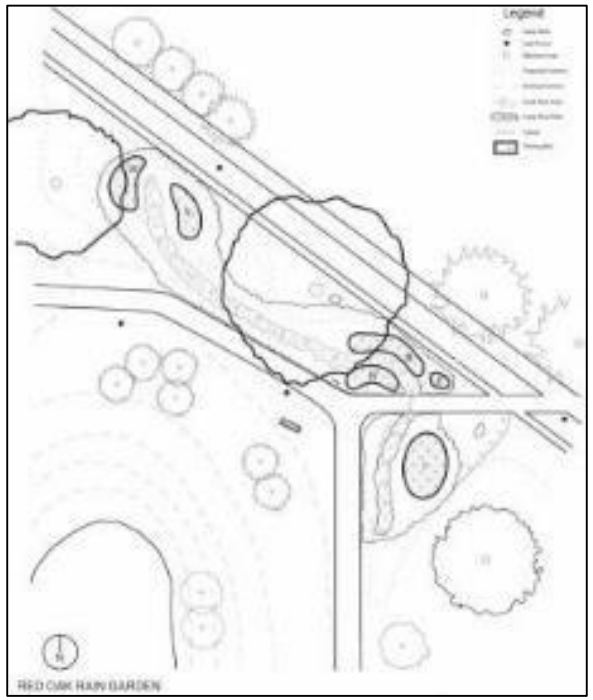
Location image: Google Earth

“BEFORE” STANDING WATER NEAR OAK TREE

Standing water after heavy rain event in Spring of 2006

FACULTY/STUDENT PROJECT: RORG 1.0

Prof. Tony Endress' NRES Class 2006



Original installation plan 2006

Students installing stone and plants in Fall 2006

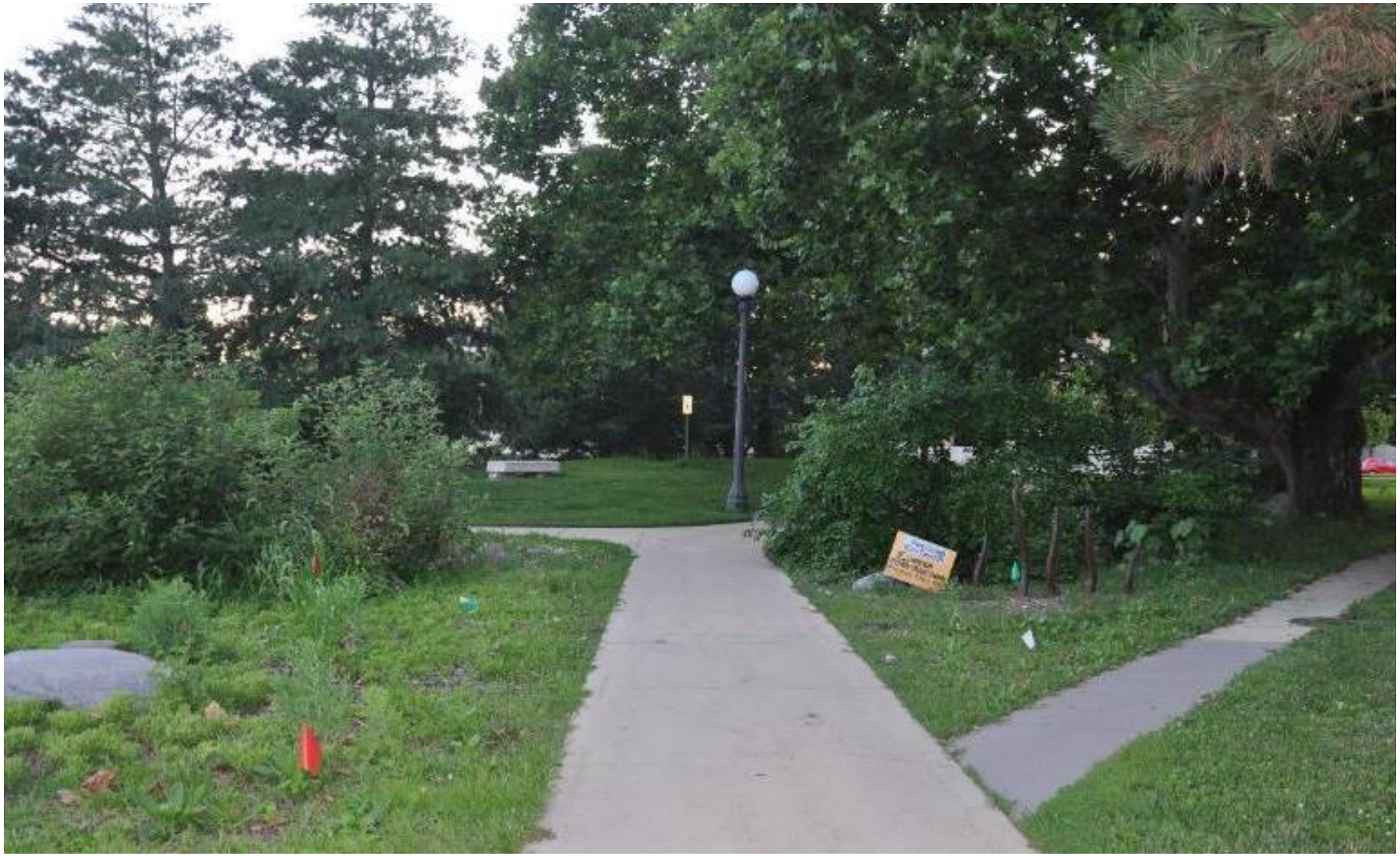
IN THE BEGINNING

Original Rain Garden with stone centered design in Fall 2006

11 YEARS LATER: STONE FOULED

Original Rain Garden with stone centered design in Spring 2017

BEFORE RENOVATION in 2019: RORG 1.0



Weedy and overgrown in May 2019

AFTER RENOVATION in 2020: RORG 2.0

First Season of Growth 2020

VOLUNTEERS

Layne Knoche training student volunteers in 2019. Photo by Eliana Brown.

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RED OAK RAIN GARDEN

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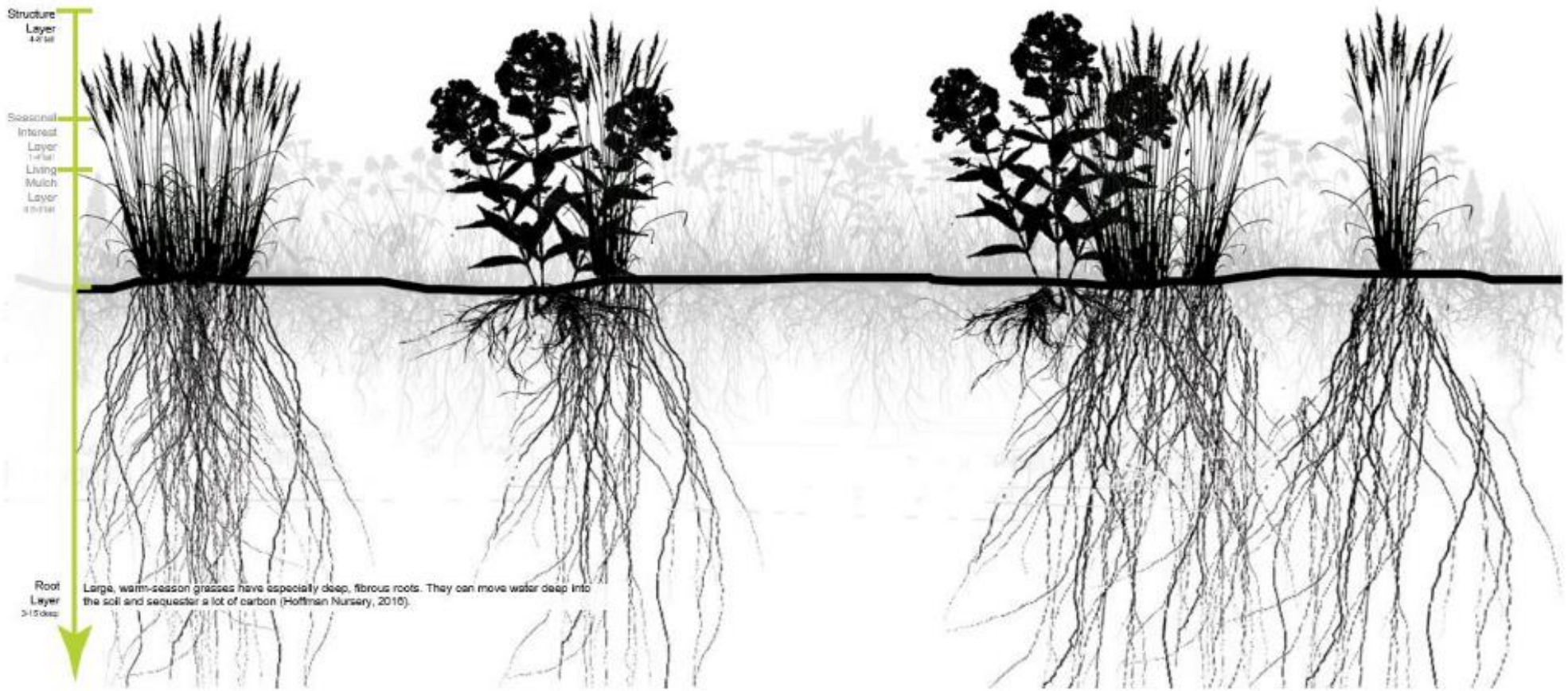
VOLUNTEERS

Student and Extension volunteers working side-by-side. Photo by Kate Gardiner.

PLANT FOCUSED DESIGN



Plant design basis: “Planting in a Post-Wild World” by Thomas Rainer and Claudia West

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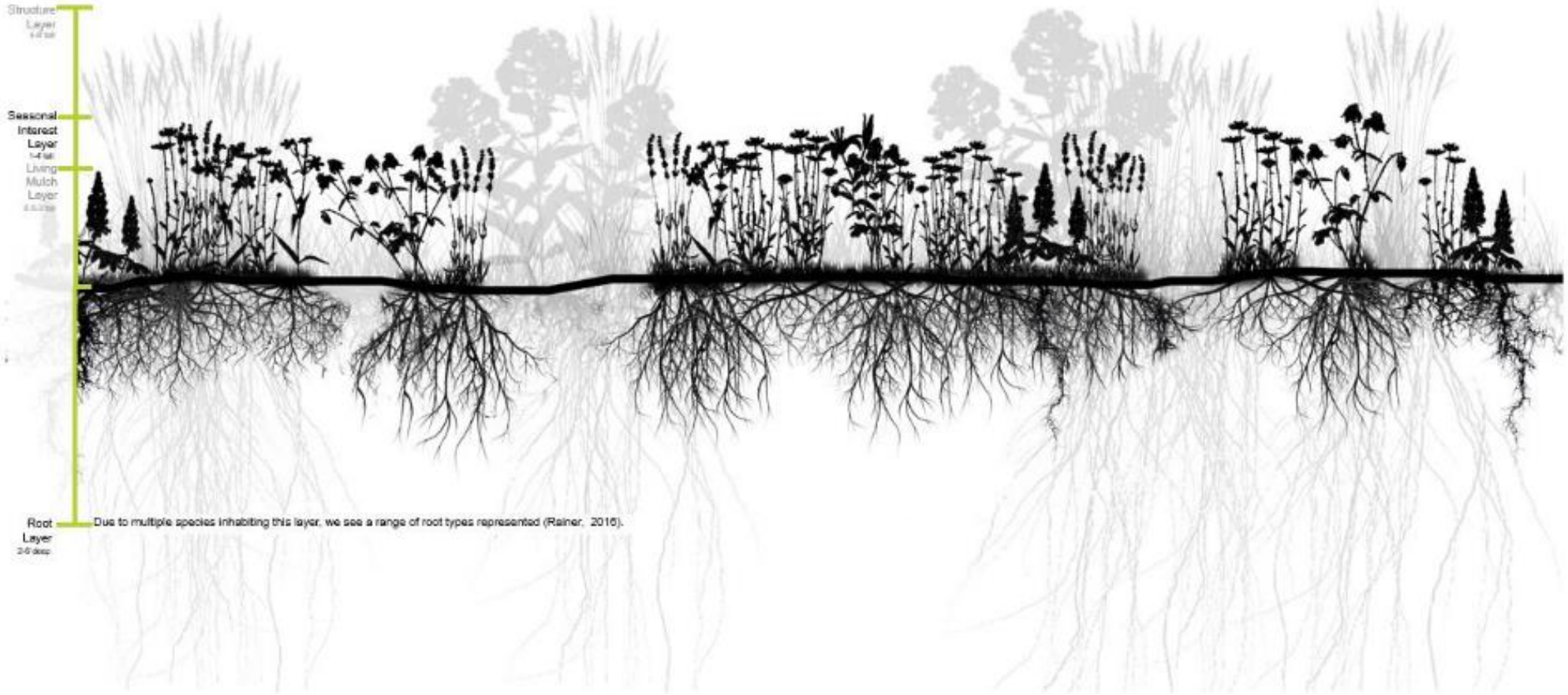

Plant design basis: “Planting in a Post-Wild World” by Thomas Rainer and Claudia West

PLANT FOCUSED DESIGN

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RORG TAKE AWAYS

- Maintenance must be planned for.
- Designing with maintenance in mind is helpful.
- Trained volunteers can provide care as part of service learning.
- **But, comprehensive, campus-wide rainwater management requires trained university staff and the funding to support it.**

http://RedOakRainGarden.org
Follow us: @RainGardenUIUC

"Both cities grew, with a mile and a half of open land between them. Planks had been laid to make a road across the ***swampy land*** and a horse drawn streetcar took people back and forth between the cities. It wouldn't be long, though, before something important would fill this land."
Allice McGinty
Champaign Public Library

UIUC Institute for Genomic Biology. Photo credit: Bruce Busboom

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Champaign Public Library

"**Nature** is party to all our deals and decisions, and she has **more** votes [and] a longer **memory**… than we do."
Wendell Berry

Final Thought

It's important for a world class, land grant university – **built on swampy land** – to have **exemplary rainwater management.** It's an opportunity to do it really well.

Not only for campus, but so you, and **students like you, can be trained to be stormwater leaders** mitigating climate change wherever you go, when you leave here.

Thank you!

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