

City of Madison Leaf Management and Citizen Action to Reduce Phosphorus Loading to Lakes

Presenter:
Phil Gaebler -City of Madison Engineering

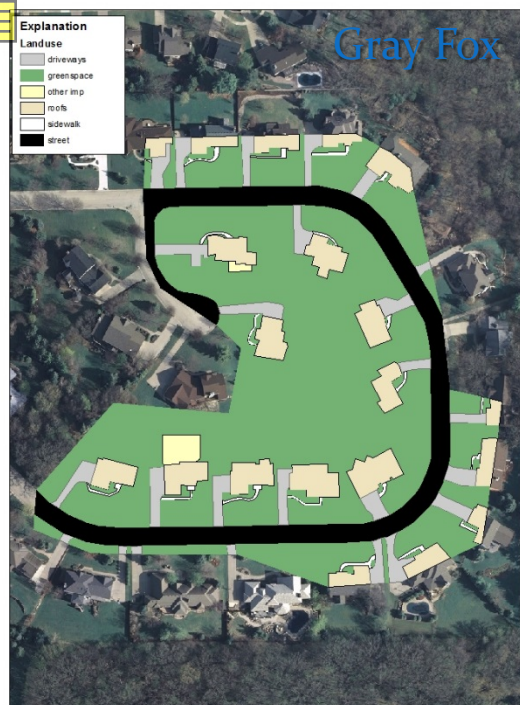


Madison leaf Management

- **Existing Costs:**
 - \$2.3 million for leaf collection and composting
 - In 2016: 15,774 tons of leaves collected
- **Current phosphorus credit given:** zero
- **Public Perception**
 - Skepticism that current practices were beneficial
 - Request to switch to vacuum collection
- **Important research for TMDLs across the country**



• 3-4 pick ups a season plus mechanical sweeper .

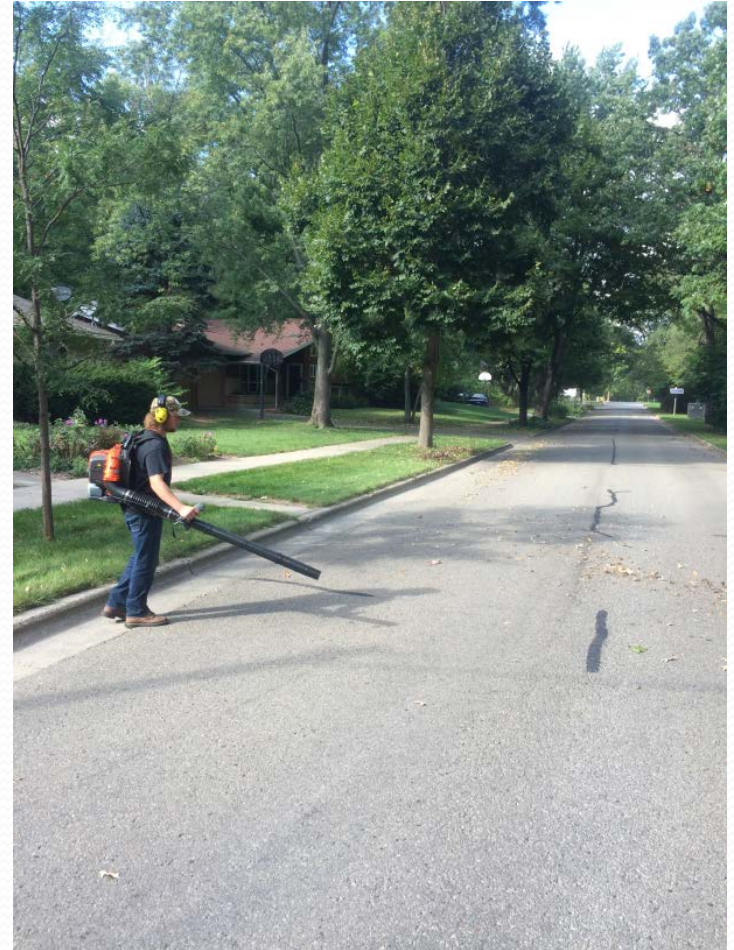


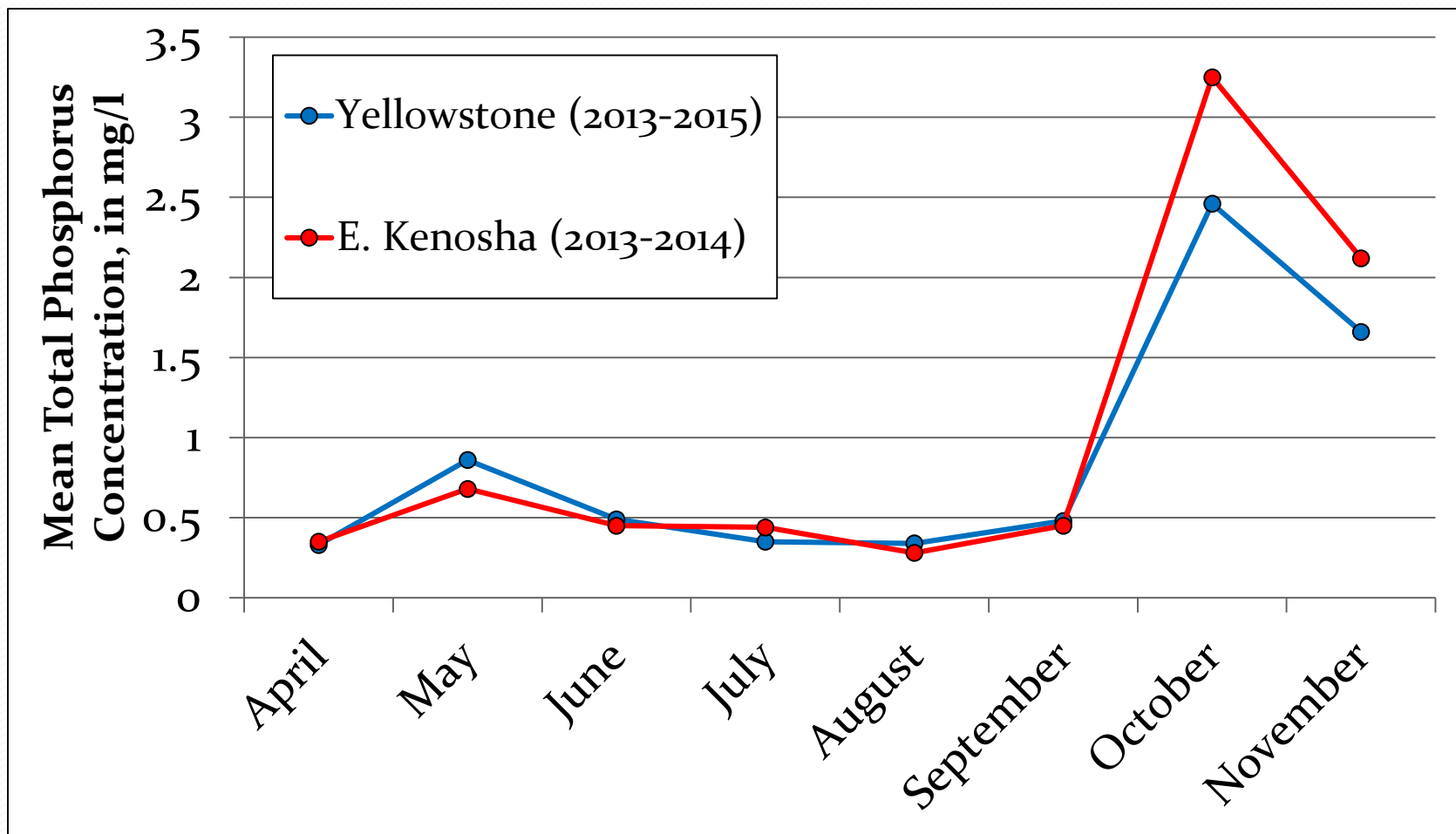
Study Overview

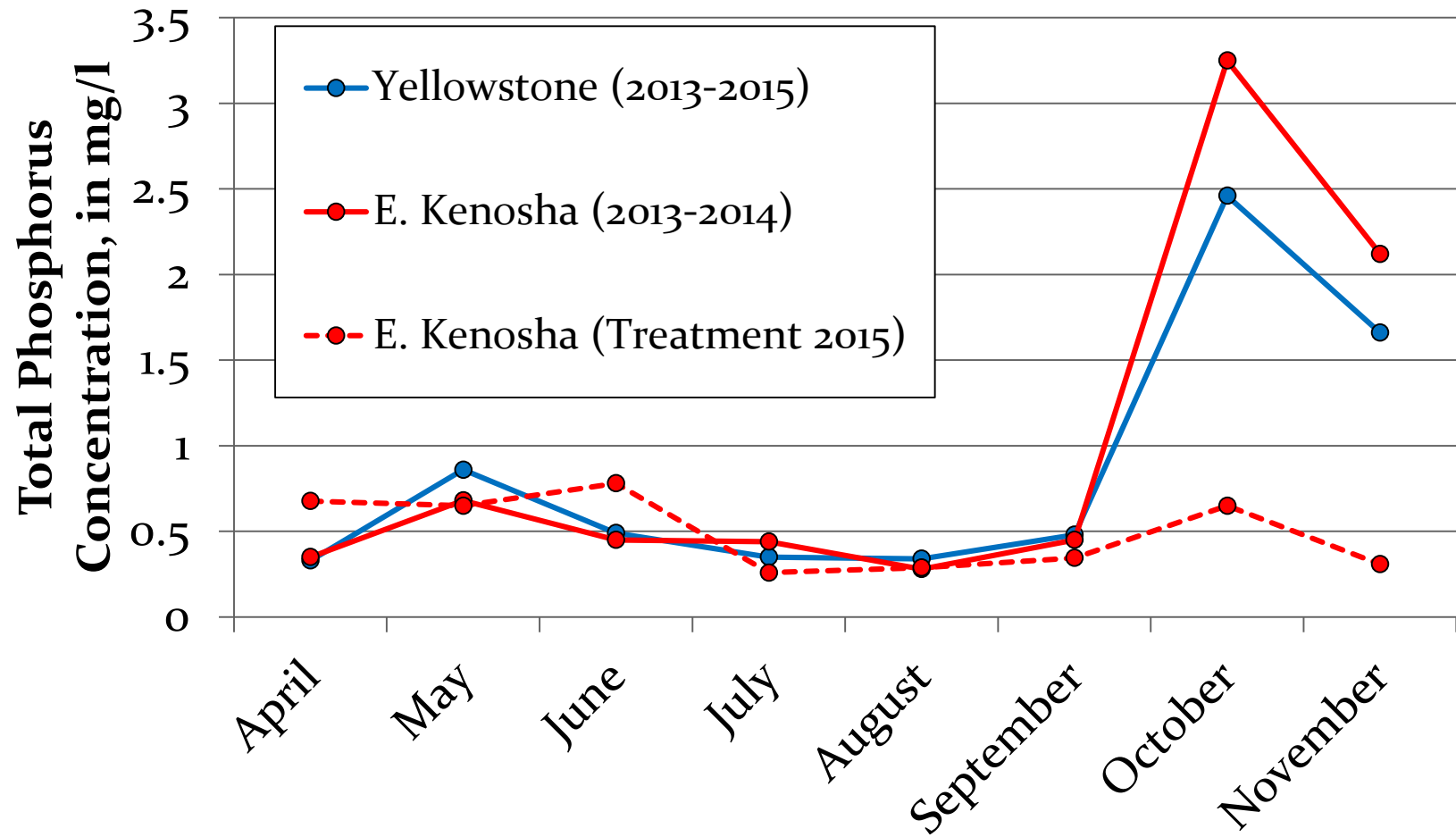
- Paired Basin Study
- 5 years
- Quantified Extremes of Removal Options
- Filled in the gaps with additional comparisons

“Escalated” Leaf Management

In addition to municipal efforts, USGS field crews would clear all organic debris from street surface prior to rain event

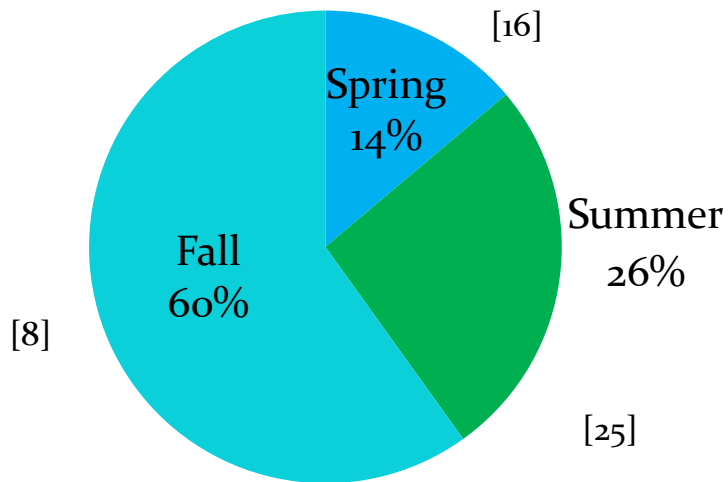




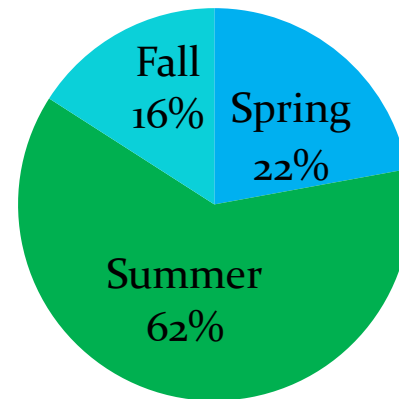


Seasonal Total Phosphorus Load as a Percent of the 2015 Annual Load (winter excluded)

**Yellowstone
(Control)**



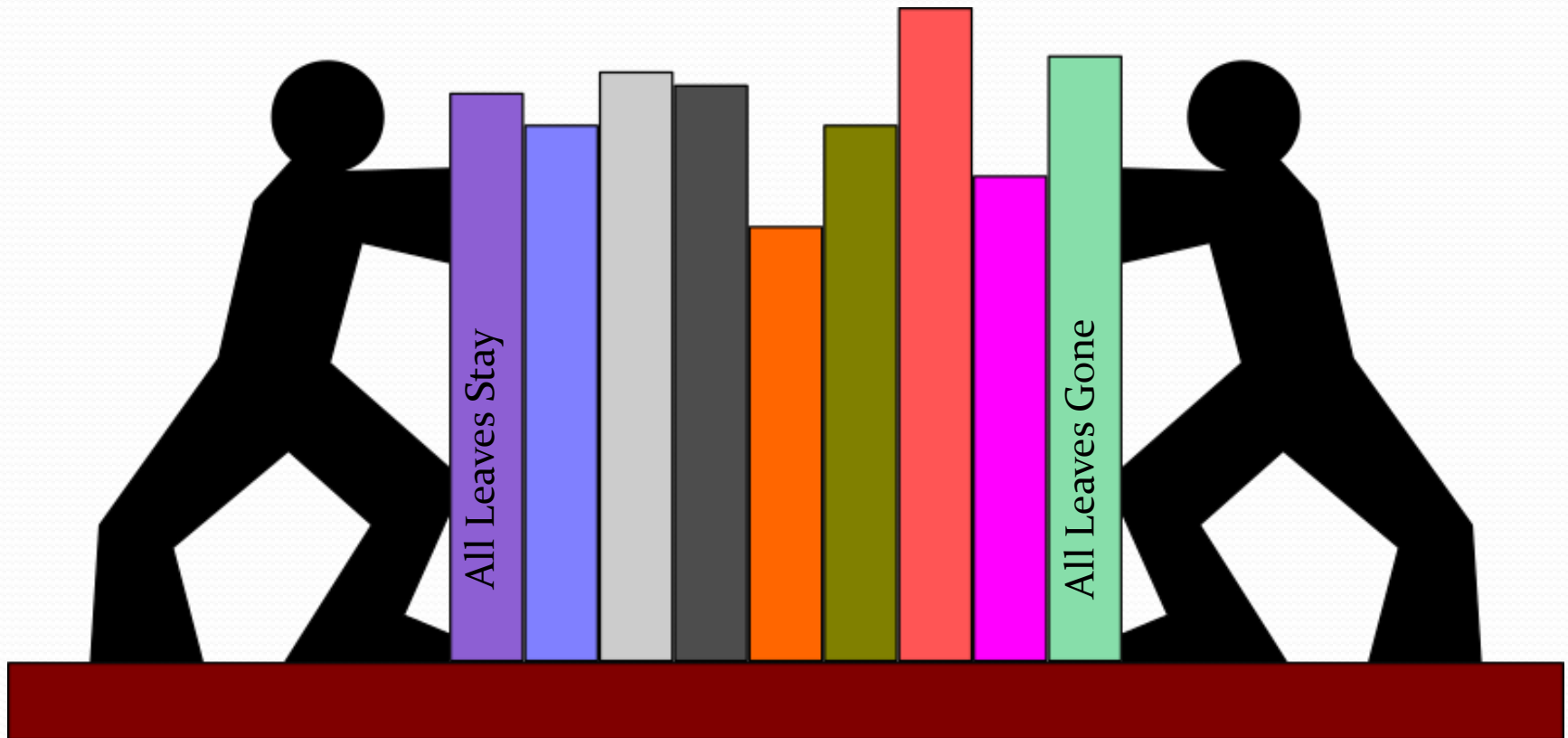
**E. Kenosha
(Test)**



[3] = Number of events

Impact of Collection on Phosphorus

0% Phosphorus Reduction 80%



Leaf Collection

Method	Frequency
Transfer	Weekly
Transfer	Biweekly
Transfer	Biweekly
Vacuum	Weekly
Transfer ¹	Biweekly

¹ Medium density canopy

Street Cleaning

Method	Frequency
Mechanical/blower	Pre-event
Mechanical	Biweekly
Regenerative Air	Weekly
Regenerative Air	Weekly
Regenerative Air	Weekly

Year Completed	Title
2015	Upper Maximal
2016	Madison SOP
2017	Madison SOP+
2017	Vacuum Mulch
2018	Madison SOP+



Weekly Vacuum Sweeper Impact



10/5/2017



10/6/2017



10/9/2017

Bagging

- Bagging
 - Asked two neighborhoods to bag all leaves
 - One was given bags
 - One asked to purchase
 - Leaf accumulation assessed
 - No water quality assessment



Bagging Results

- High participation when provided bags
- Low participation when asked to purchase
- Cleaner streets
- High cost to citizens if implemented city wide
 - ~\$5 per house (12-16 bags)
- % reduction dependent on 2017 data



Vacuum Collection Trial

Test:

- Weekly Vacuum Collection + Weekly Sweeping

Results:

- Streets noticeably cleaner
- Cost doubled
- Transport costs would increase
- Measured TP reduction



City of Madison – Leaf Collection plus Sweeping

“Madison SOP, SOP+, and Vacuum-Mulch”

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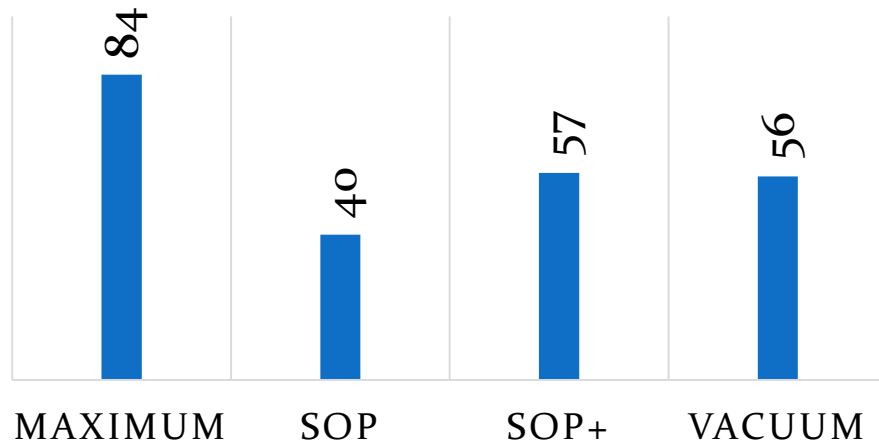
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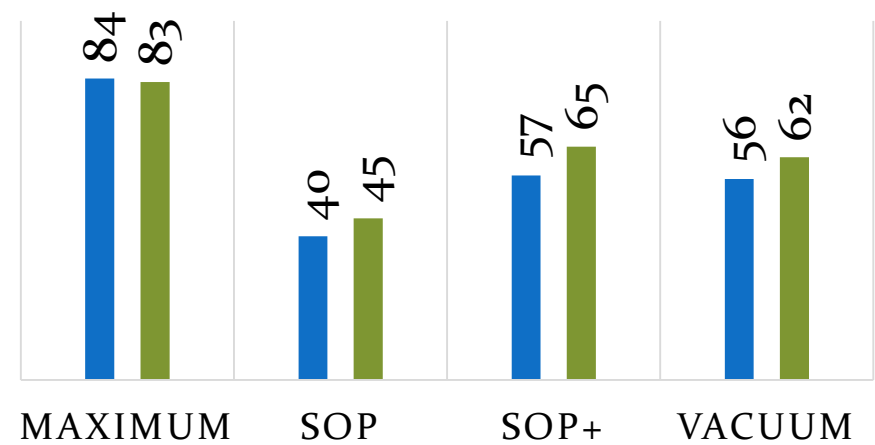
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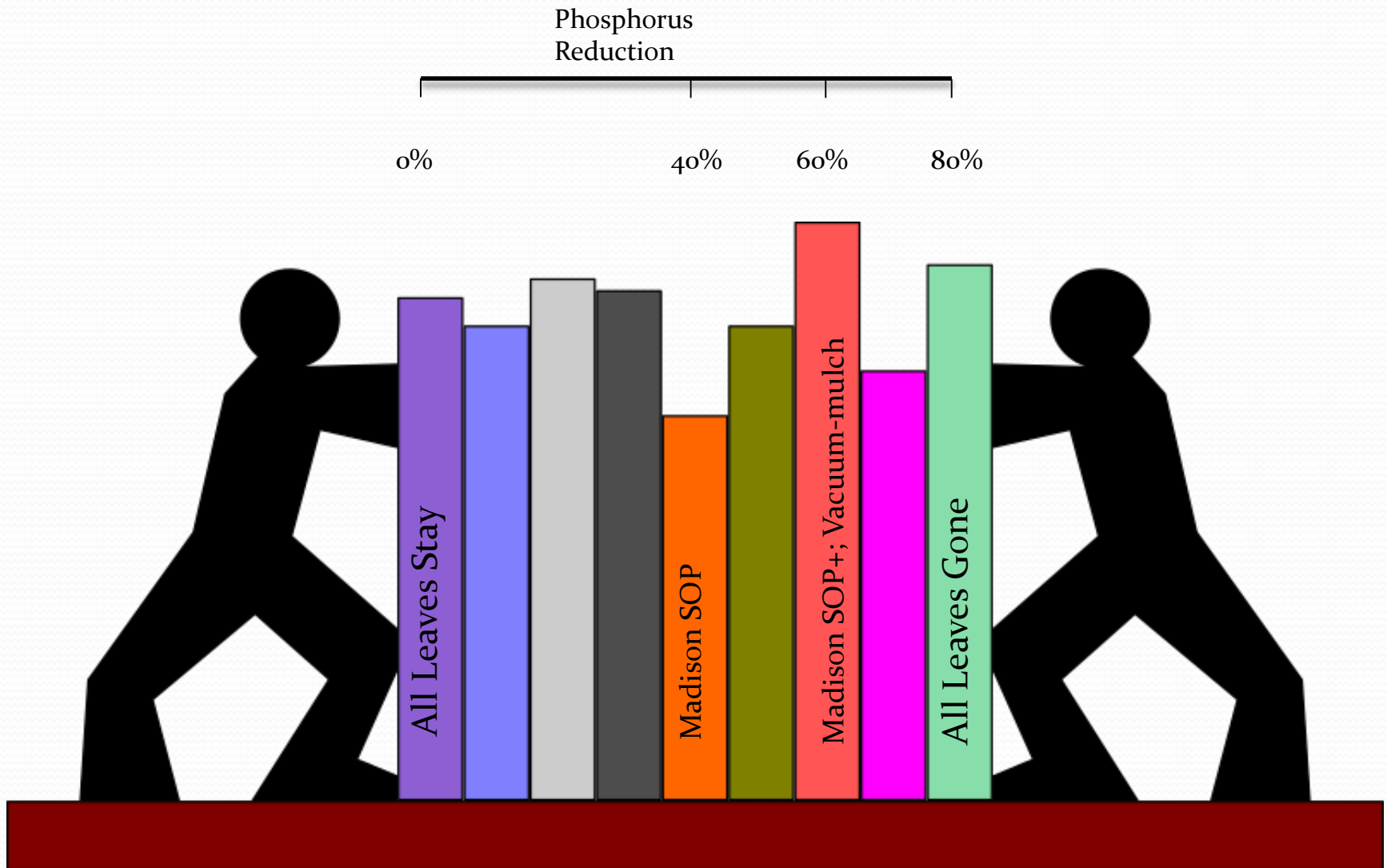
TOTAL PHOSPHORUS REDUCTION



TOTAL AND DISSOLVED PHOSPHORUS REDUCTION



Collection Impacts on Total Phosphorus



Increased Removal Frequency = Decreased Phosphorus Loading

- 800 miles of curb in medium to high canopy area
- Cost benefit analysis of practices based on WDNR Guidance
 - 17% reduction in TP from high canopy medium density residential for Madison SOP
 - ~300 lb TP

Citizen Action

- Leaf piles on grass
- Rake leaves from the street before storm
 - Sign up for Alerts:
 - www.Ripple-Effects.com
- Compost on site
- “Chop and Drop”
 - Mowing frequently may be enough for some.

Leaves Out of the Street



Keeping leaves out of the street is one of the simplest ways to help keep **Lake Wingra** clean.

Leaves are a big source of **phosphorus**, a nutrient that feeds **weeds and algae** in our lakes. When they get driven over and rained on, leaves release phosphorus, which gets sent to the lake via the nearest storm drain.

We Need Your Help!

**Keep Lake Wingra clean:
Keep leaves out of the street.**

BE INFORMED

Know when to expect leaf collection in your neighborhood by bookmarking the City web site. Tell your neighbors!

RAKE

Leaves should be raked just before collection so they don't blow into the street.

MAINTAIN

Keep leaves out of the street while waiting for City leaf collection

www.cityofmadison.com/streets/yardwaste/

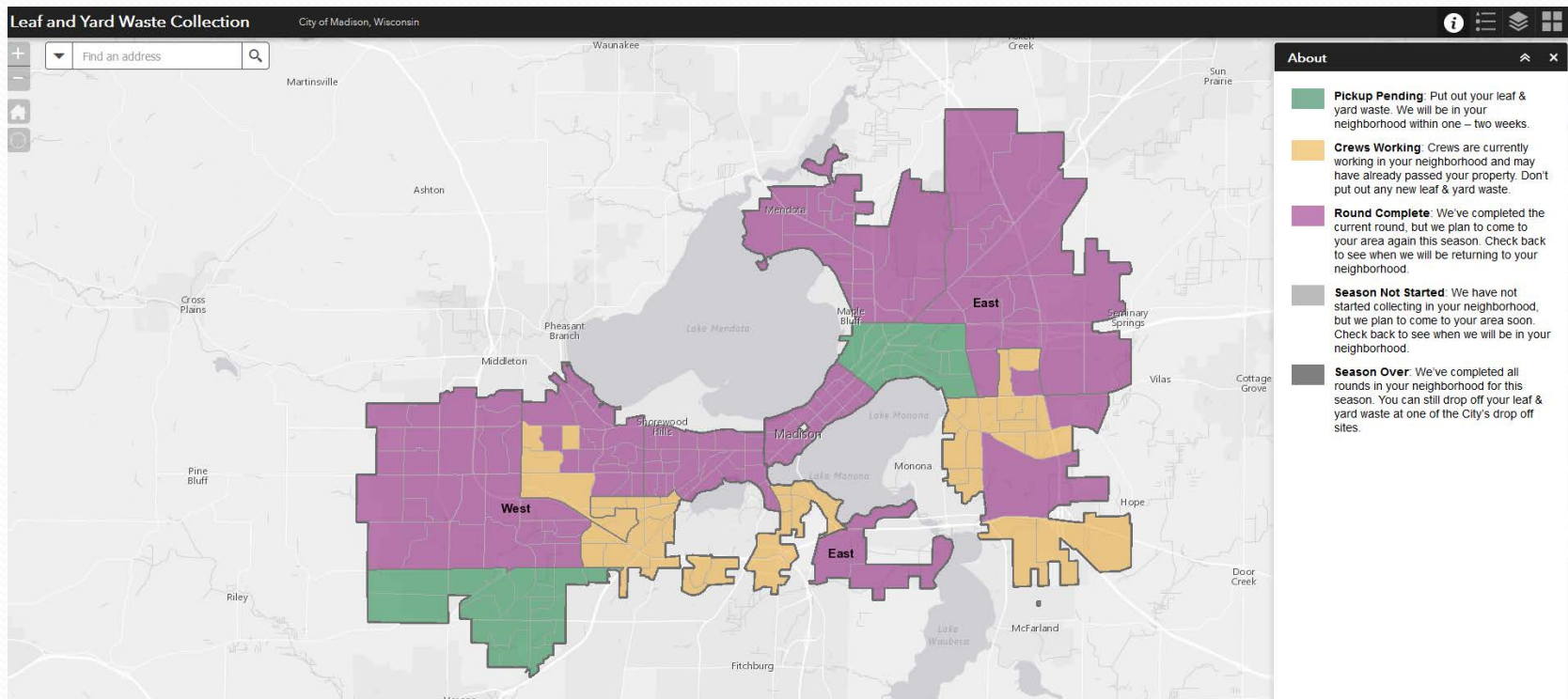


Want an alternative to raking leaves to the curb?

Use your leaves as fertilizer!

You can **mow over** leaves on your grass to grind them up or **compost** them for use on your gardens next year.

Reduced Raking into Street with Improved Collection Maps



<http://www.cityofmadison.com/streets/yardWaste/leaf/>

#1 critique is the non-defined collection time

Curb Line Clear



Leaf Piles on Grass



City of Madison has an Ordinance prohibiting leaves in the street but it is complaint driven

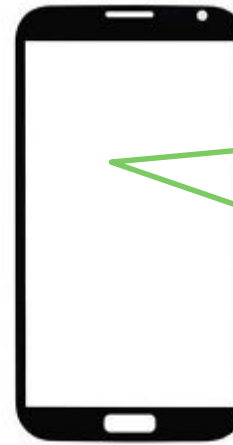
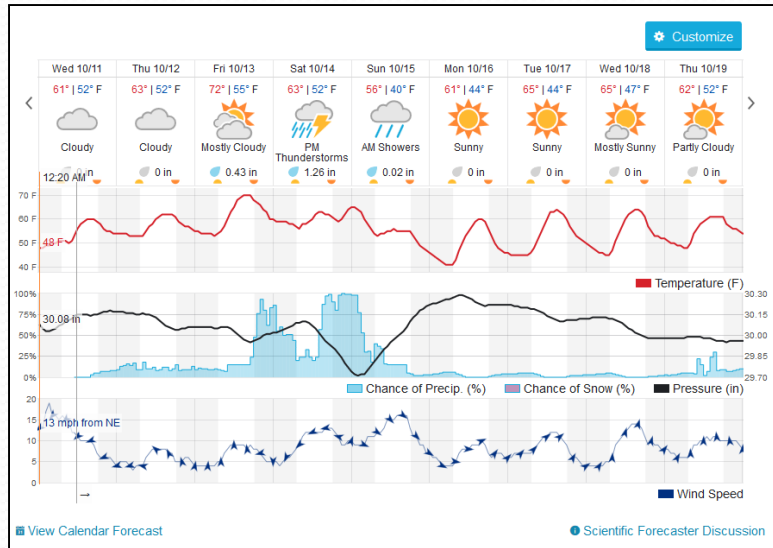
Mulch or Compost



Less work
Less transportation
Good for lawn or garden
Higher frequency?
Outreach planned for 2018



Text Alerts when Rain is Coming



Rain is predicted.
Time to rake leaves
from the gutter.

~200 residents
signed up so far



Leaf-free Streets
For Clean Waters

www.Ripple-Effects.com



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