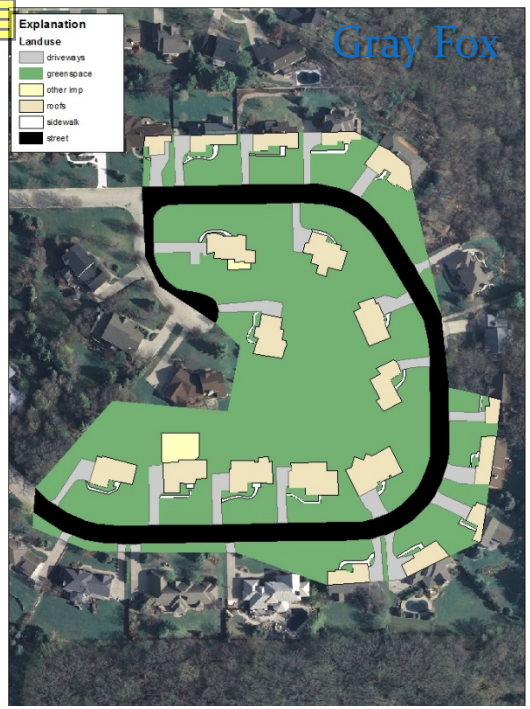
City of Madison Leaf Management and Citizen Action to Reduce Phosphorus Loading to Lakes

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 .

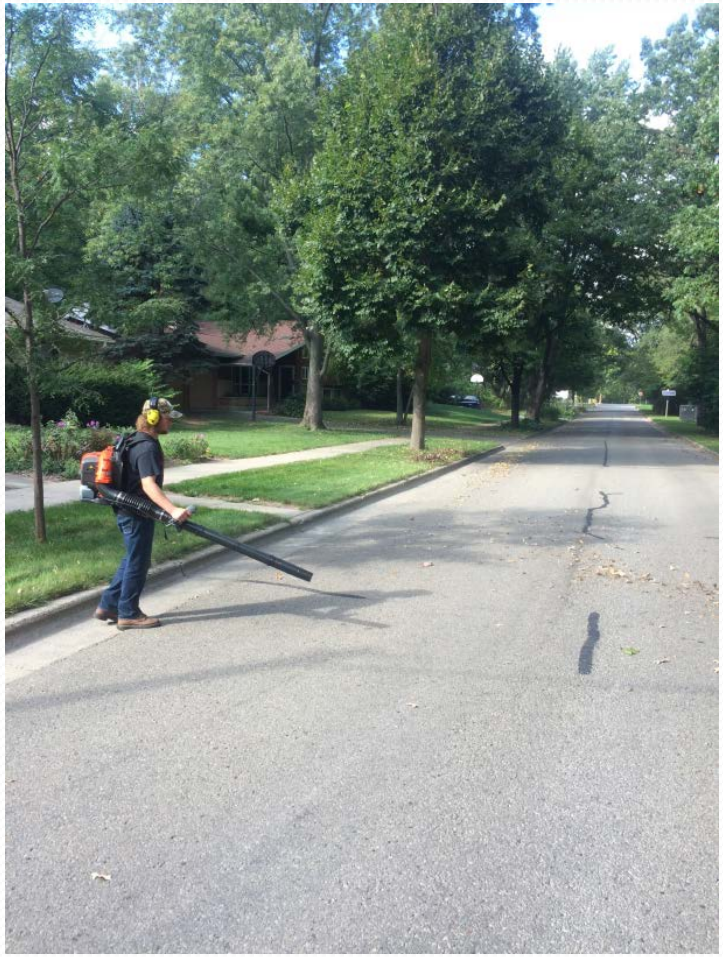


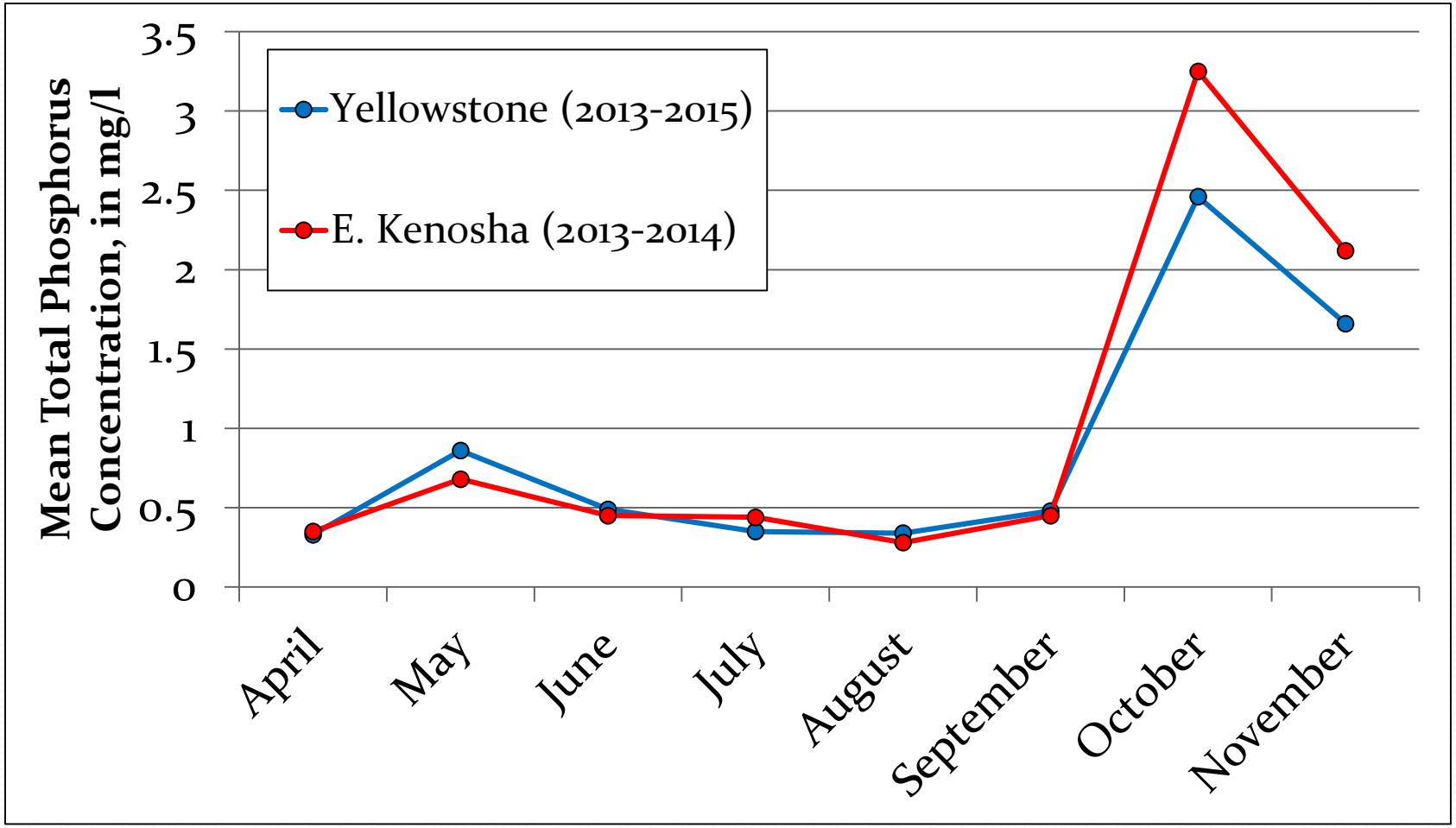
Study Overview

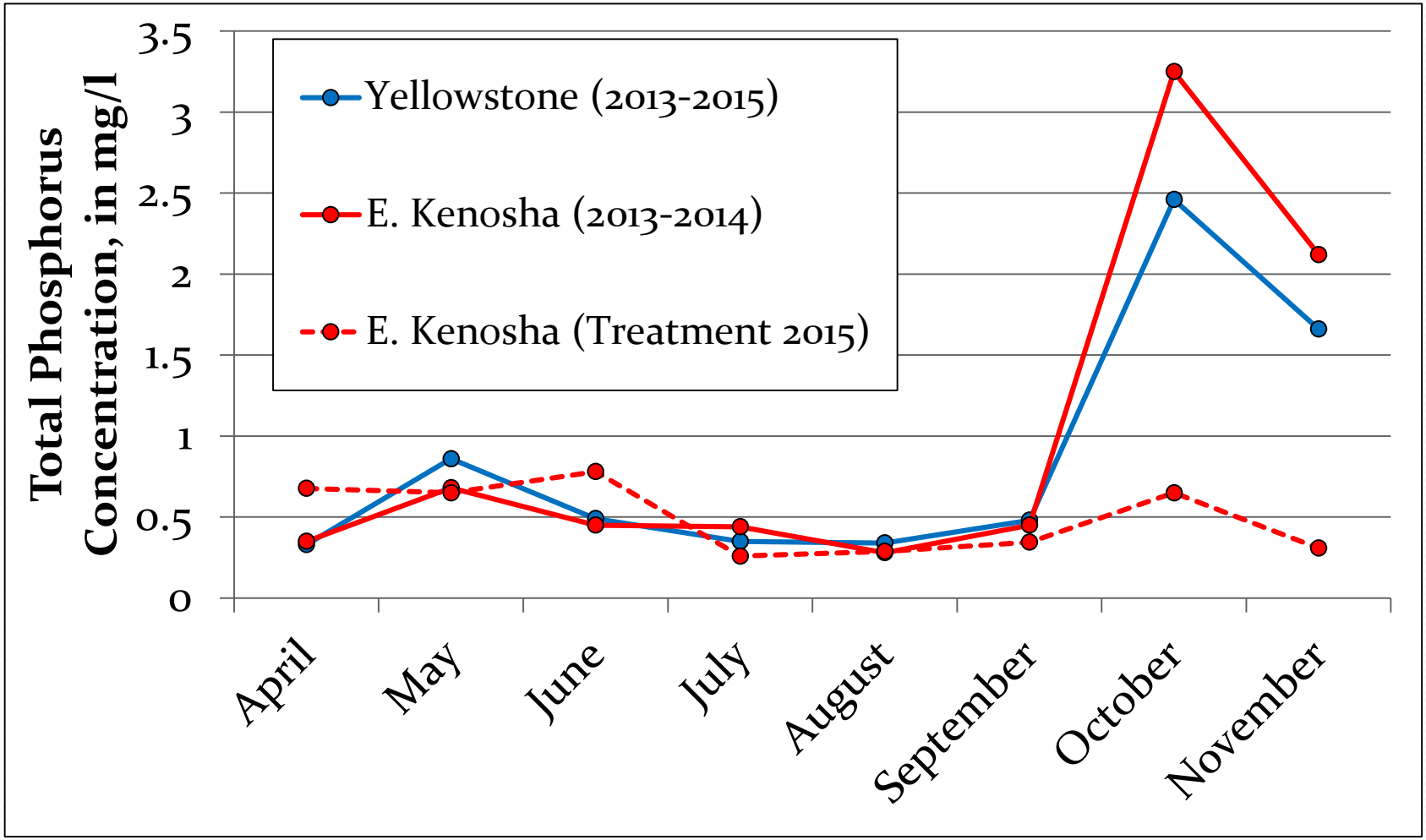
- Paired Basin Study
- 5 years
- Quantified Extremes of Removal Options
- Filled in the gaps with additional comparisons

“Escalated” Leaf Management

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




Mean Total Phosphorus Concentration, in mg/l
3.5
3
2.5
2
1.5
1
0.5
0
Yellowstone (2013-2015)
E. Kenosha (2013-2014)
April
May
June
July
August
September
October
November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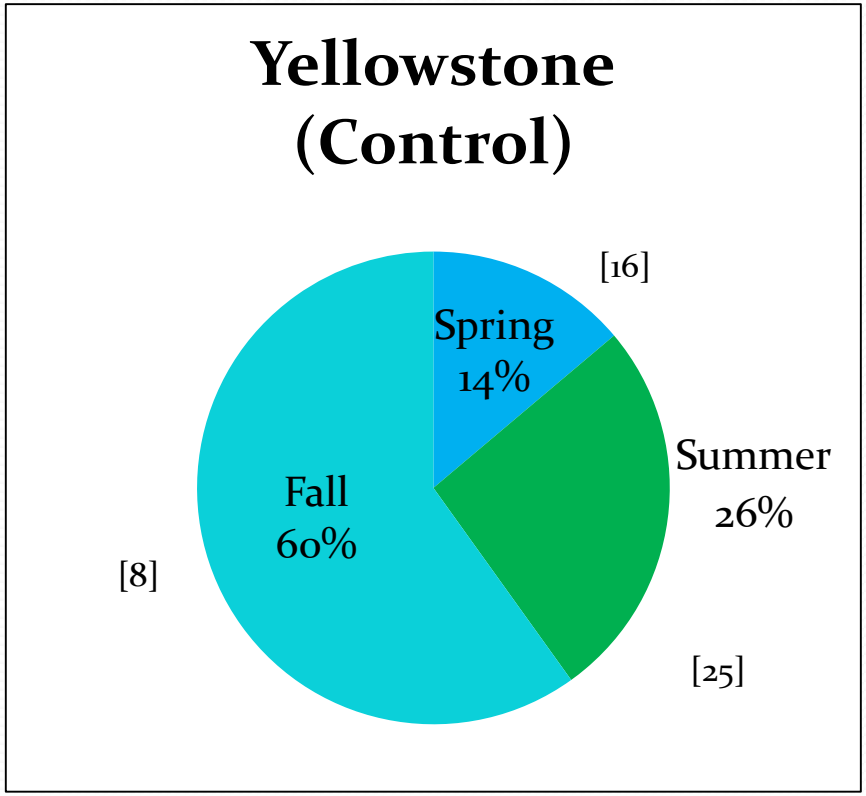
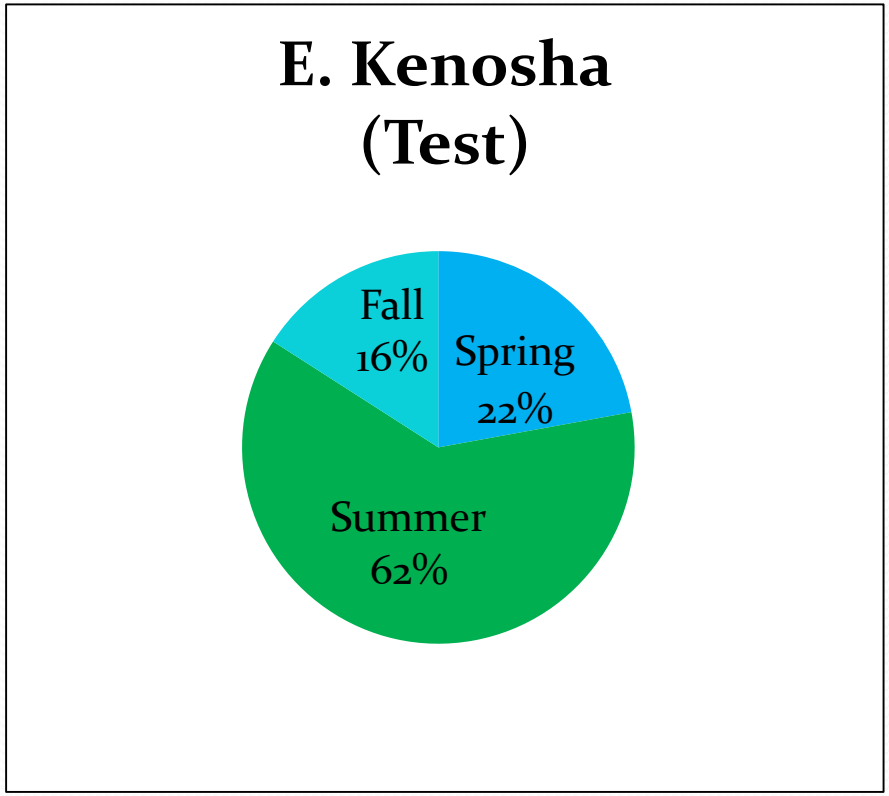
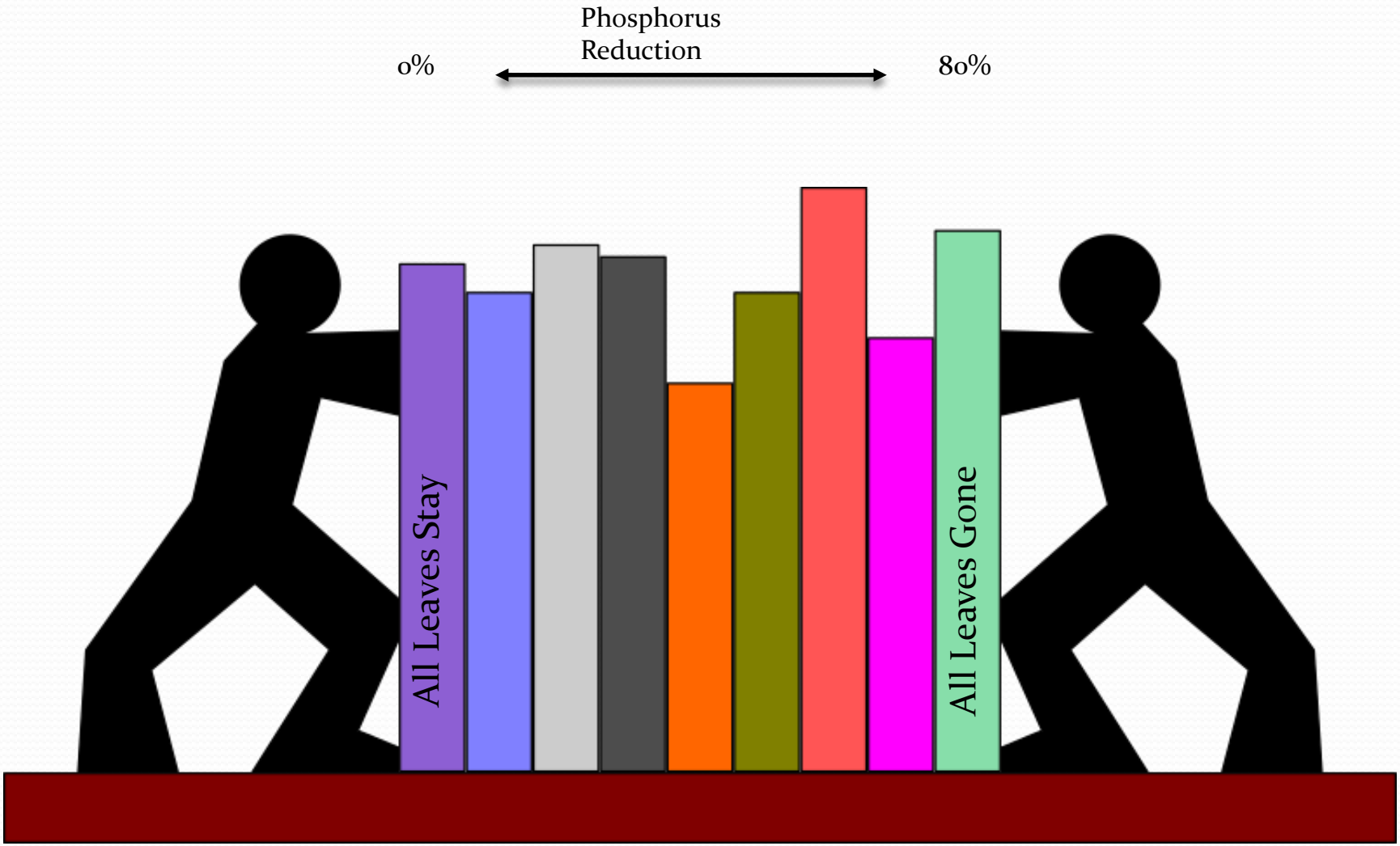
Seasonal Total Phosphorus Load as a Percent of the 2015 Annual Load (winter excluded)





[3] = Number of events

Impact of Collection on Phosphorus



Leaf Collection		Street Cleaning			
Method	Frequency	Method	Frequency	Year Completed	Title
Transfer	Weekly	Mechanical/blower	Pre-event	2015	Upper Maximal
Transfer	Biweekly	Mechanical	Biweekly	2016	Madison SOP
Transfer	Biweekly	Regenerative Air	Weekly	2017	Madison SOP+
Vacuum	Weekly	Regenerative Air	Weekly	2017	Vacuum Mulch
Transfer[1]	Biweekly	Regenerative Air	Weekly	2018	Madison SOP+

[1] Medium density canopy

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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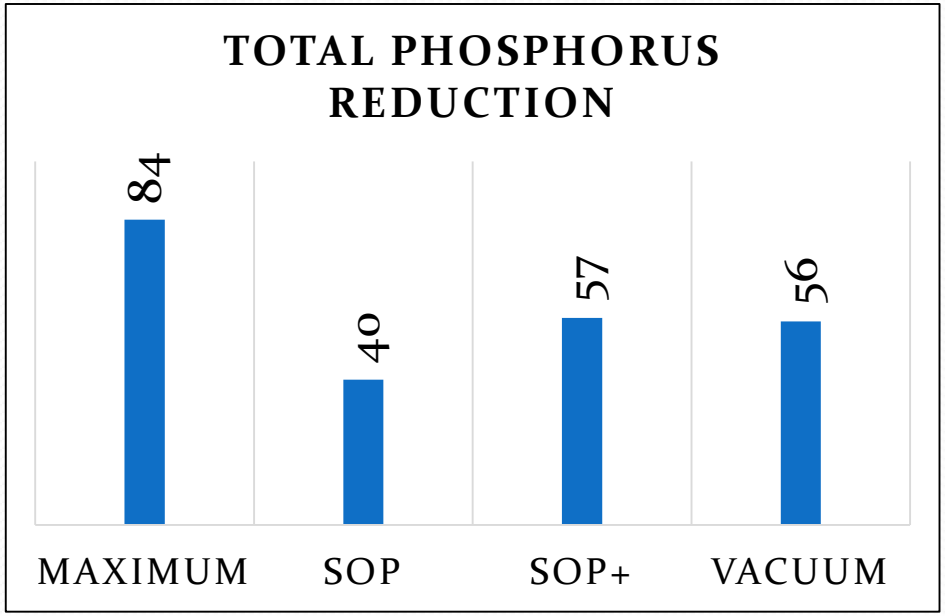
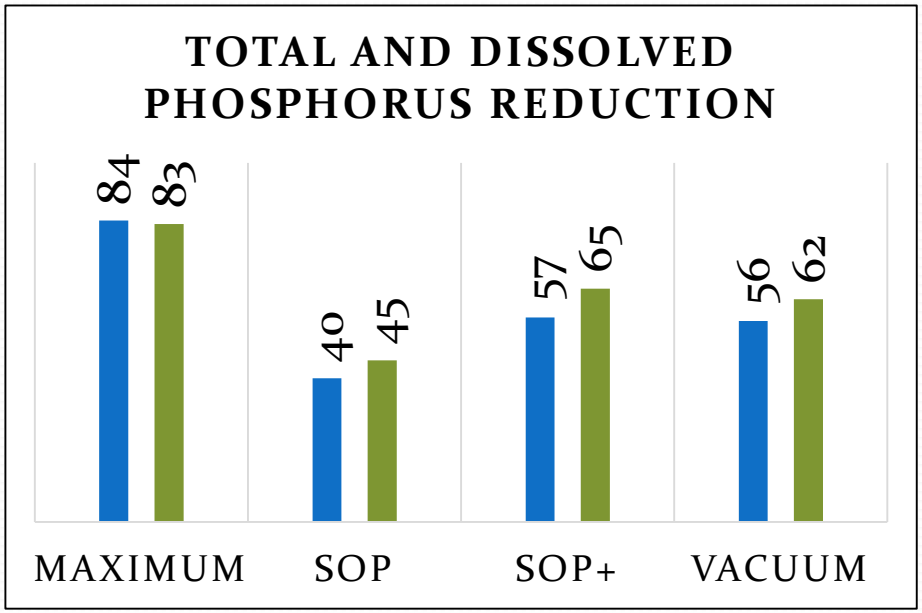
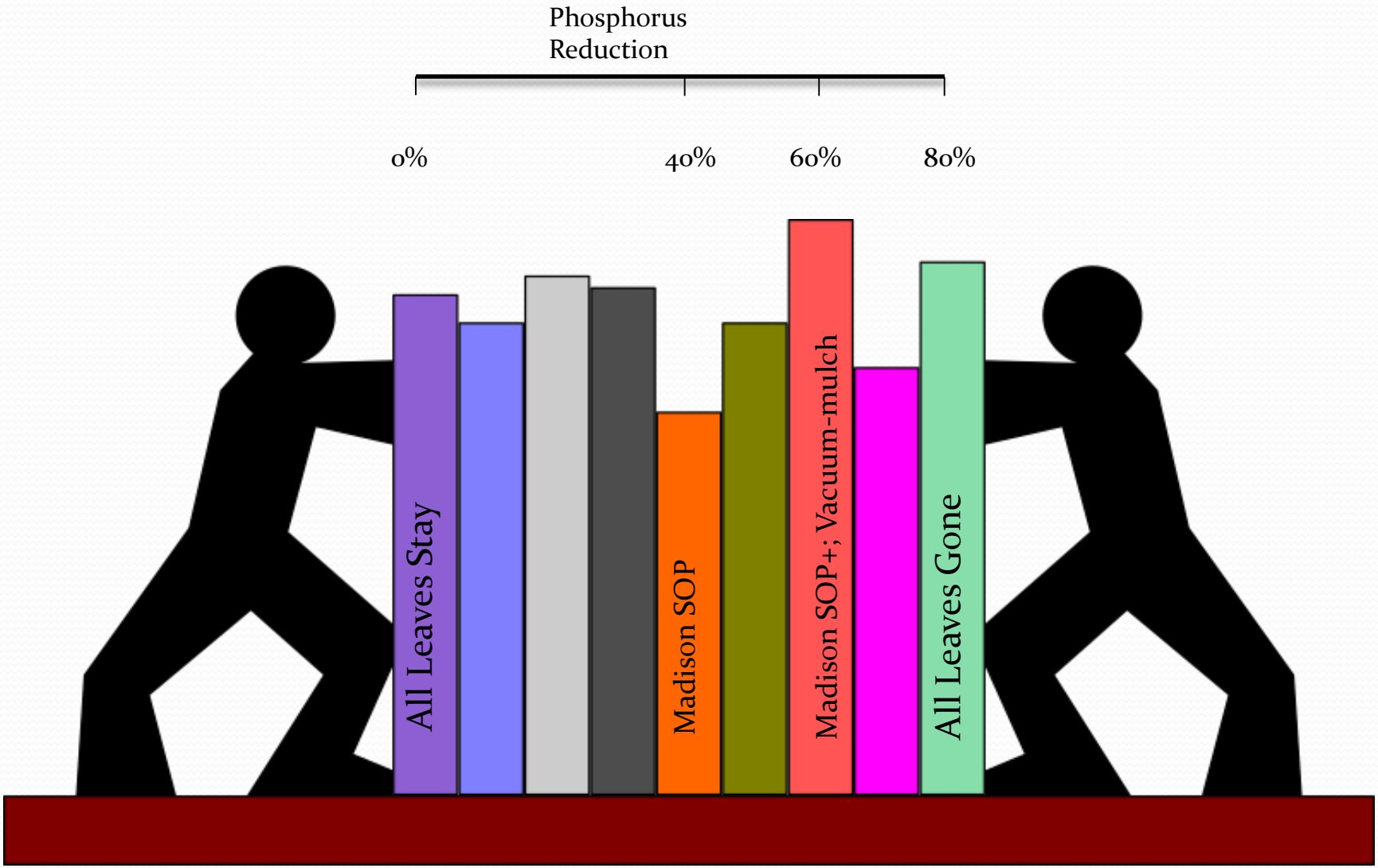




Collection Impacts on Total Phosphorus



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

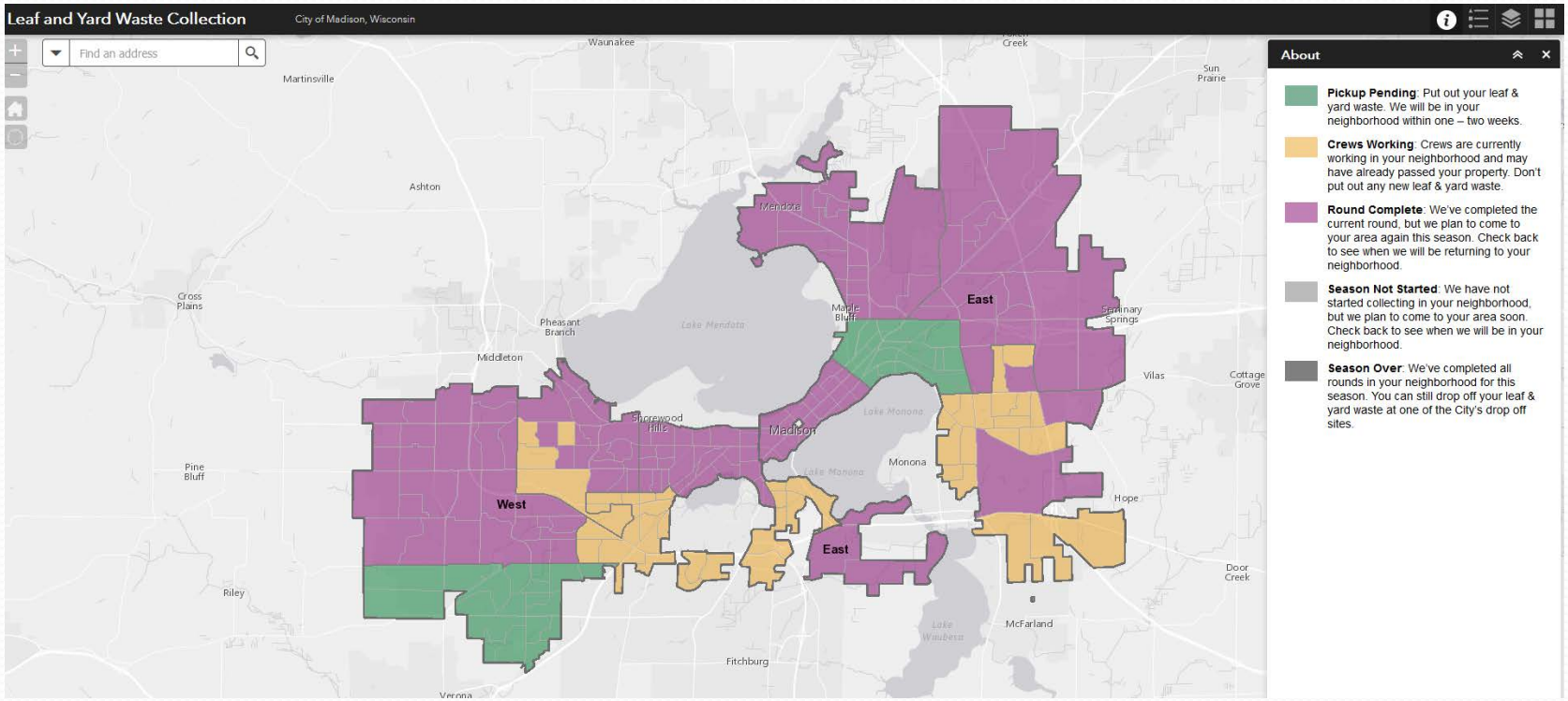
www.cityofmadison.com/streets/yardwaste/

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

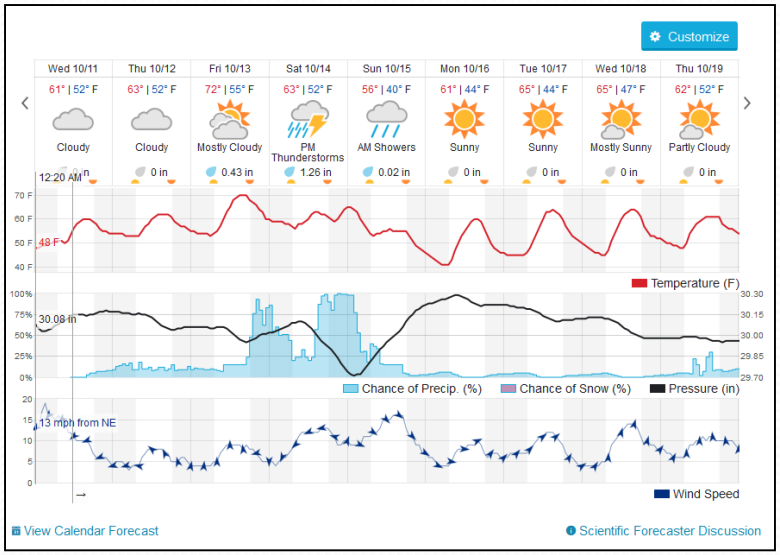
Leaf Piles on Grass

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



~200 residents signed up so far

Leaf-free Streets
For Clean Waters

www.Ripple-Effects.com

Contact Information:

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