LEAD IN THE CITY:
WHAT YOU CAN DO

Allison Harris

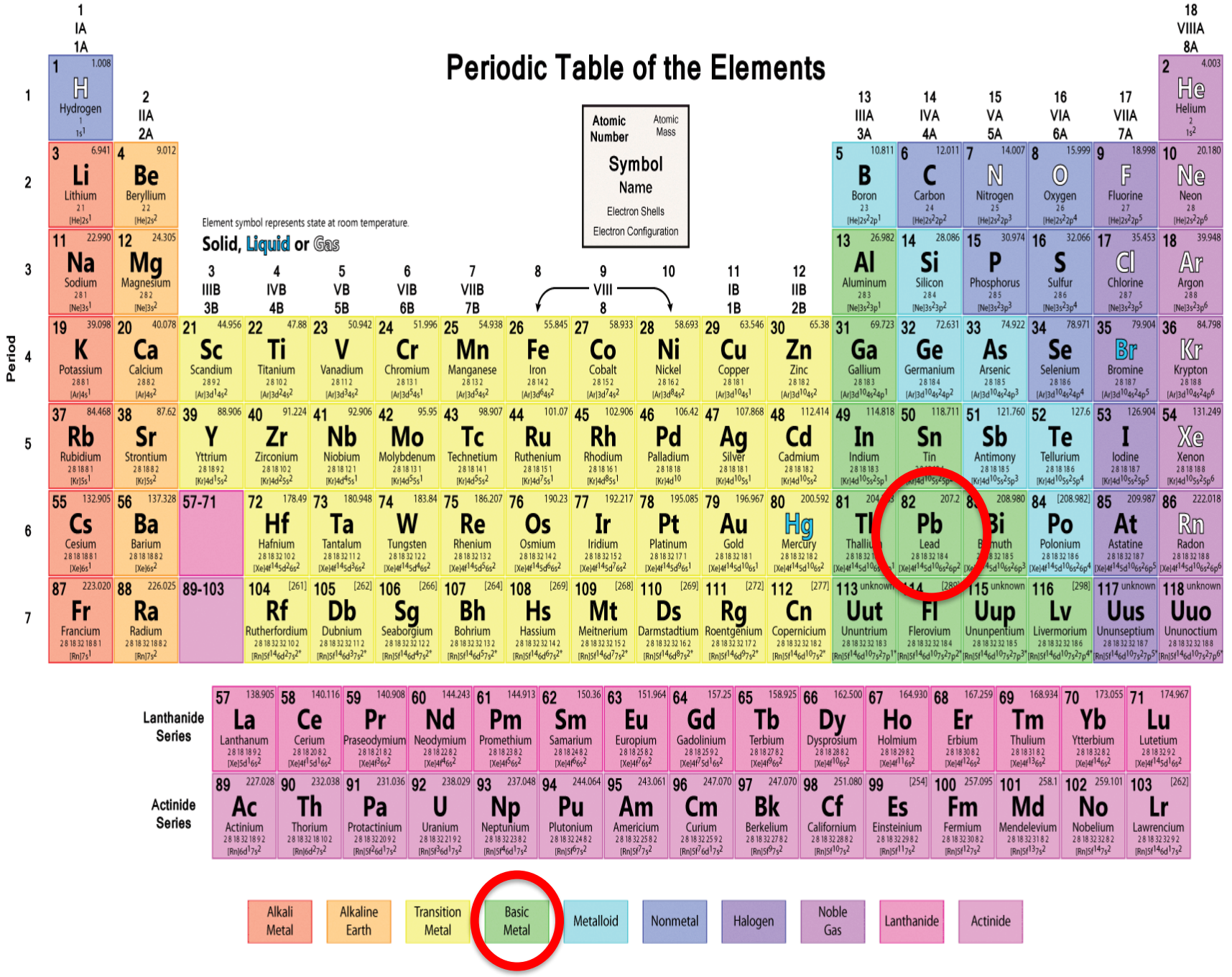
eco WORKS

CONTENTS

eco WORKS

1. WHAT IS LEAD?

Periodic Table of the Elements



SOME STUFF YOU SHOULD KNOW

- Lead is a naturally occurring element found in soils
- Human activity tends to elevate these levels
- The body has no need for lead
- Lead's periodic table symbol is Pb from the Latin Plumbum – which is where the name plumbing comes from.
- It is a heavy metal

eco WORKS

WHAT IS A SAFE LEVEL OF LEAD IN THE BODY?

WHAT IS A SAFE LEVEL OF LEAD IN THE BODY?

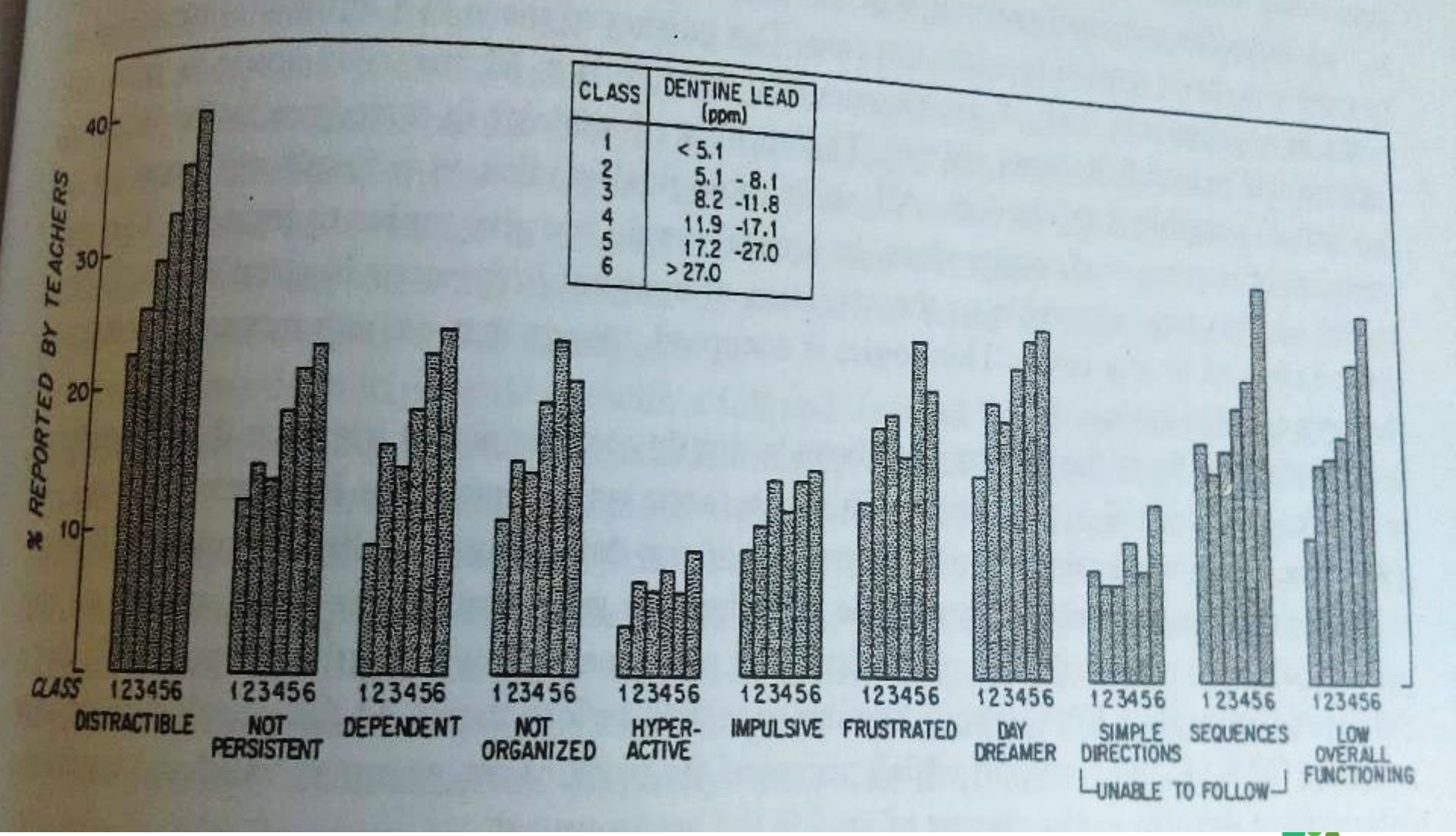
2. IS LEAD REALLY THAT BAD?

(probably)

ELEVATED LEVELS OF LEAD IS SOMETIMES CALLED LEAD POISONING

- There is no safe level of lead in the body
- Children under age 6 are most at risk
- Lead accumulates in bone
- Exposure to lead can cause damage to brain and nervous system
- That damage is permanent

eco WORKS



Needleman et al., 1974. Lead to the decision to remove lead from gasoline

eco WORKS

3. SOURCES OF LEAD

WHERE DOES LEAD IN OUR ENVIRONMENT COME FROM?

- Naturally occurring
- Paint
- Leaded gas
- Industrial air emissions
- Mine tailings
- Lead in water distribution systems
- Ammunition and fishing weights
- Various other sources – pottery, toys, makeup, chalk, etc.

4. EXPOSURE PATHWAYS

Exposure Routes

- House dust is the primary source of lead poisoning
  - What are the sources of lead in house dust?
- Water is not the biggest risk except in extreme situations (read: Flint)
- Detroit ranks 4th in the country in childhood lead poisoning

5. WHAT CAN YOU DO?

DON’T PANIC!

Pro Tips: Testing

- Blood lead levels
  - City of Detroit Health dept
- Home lead inspection
  - ClearCorp Detroit
- Soil testing
  - Keep Growing Detroit
- Water testing
  - Hardware store kits

Pro Tips: In Your Yard

- Wash hands after outdoor play or gardening
  - Especially before eating
- Wash fruits and vegetables with soap
- Plant perennials
- Cover bare soil with mulch
- Sign up for the study

Pro Tips: In Your Home

- Home renovation/remediation: Wayne County Lead Safe
- If you see chipping paint, paint over it
- Vacuum (with a HEPA filter)
- Wipe surfaces with a wet cloth
- Mop with a two bucket system
- Take off your shoes indoors

Pro Tips: Drinking water

- Run taps first thing in the morning
- Use only cold water
- Use on-the-tap filters
- Replace lead-containing pipes

Pro Tips: Gardening

- Learn about the history of your site
- Choose garden areas carefully
- Get a soil test
- Consider raised beds
- Plant perennials
- Use mulch
- Wash produce to reduce exposure
- Wear gloves/wash hands

Pro Tips: Limiting Absorption

- Have good nutrition
- Supplement with calcium and iron
  - especially after age 65

eco WORKS

Soil Lead Project

Overview

This study looks at strategies to reduce the transfer of lead in soil to garden crops, gardeners, farmers, and children. Children are at the highest risk of lead exposure because of their small bodies and rapid brain development. Children and adults can be exposed to lead by accidentally swallowing (ingestion) or breathing in (inhalation) soil particles that contain lead. This study is being conducted in Detroit, Hamtramck, and Highland Park.

The goals of this study are:

1. To identify methods to reduce the risk of exposure to lead in residential soils.

Contact Us

Allison Harris
Study Leader
E: soilleadtest@gmail.com
P: (313) 894-1030

Participants Needed!

We're looking for up to 45 participants that are interested in whole-lot treatments for soil lead. You will receive free soil aeration and organic fertilization. Email us if you're interested or have questions.

eco WORKS

CURRENT SOLUTIONS FOR LEAD IN SOIL

1.

2.

3. Live with it; practice safe, healthy habits

Lead cannot break down but it can take many forms

VS.

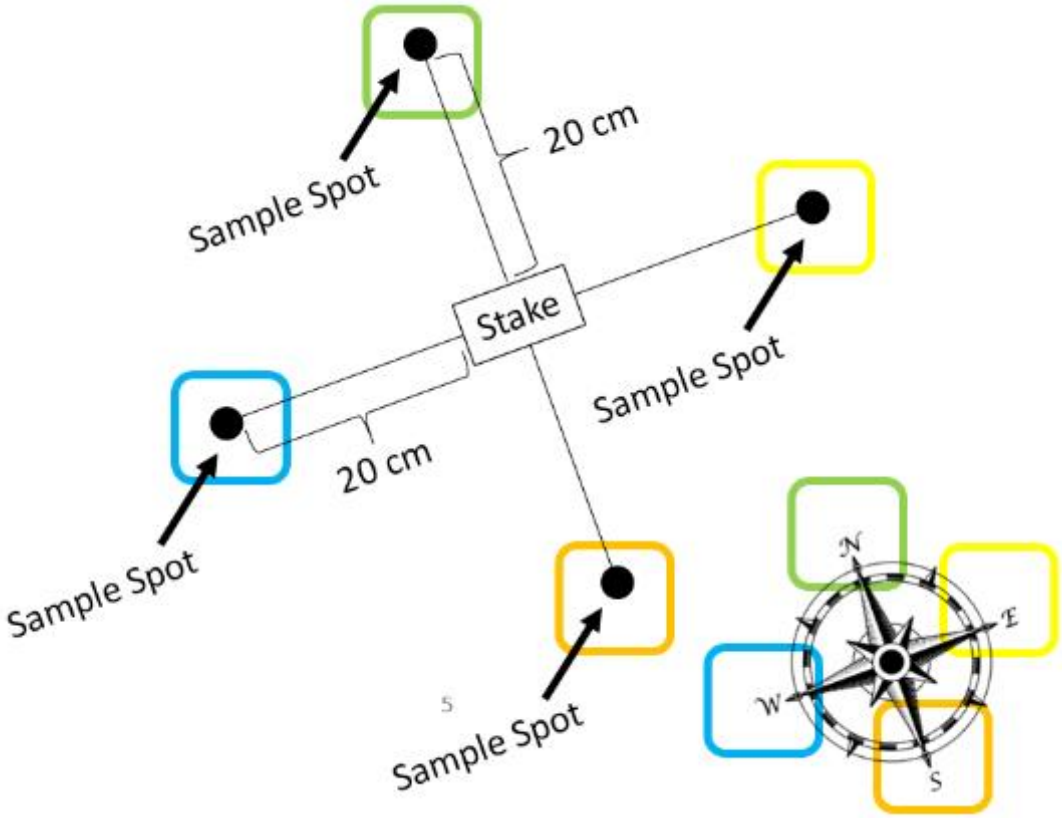
GETTING TO:

DETROIT SOILS

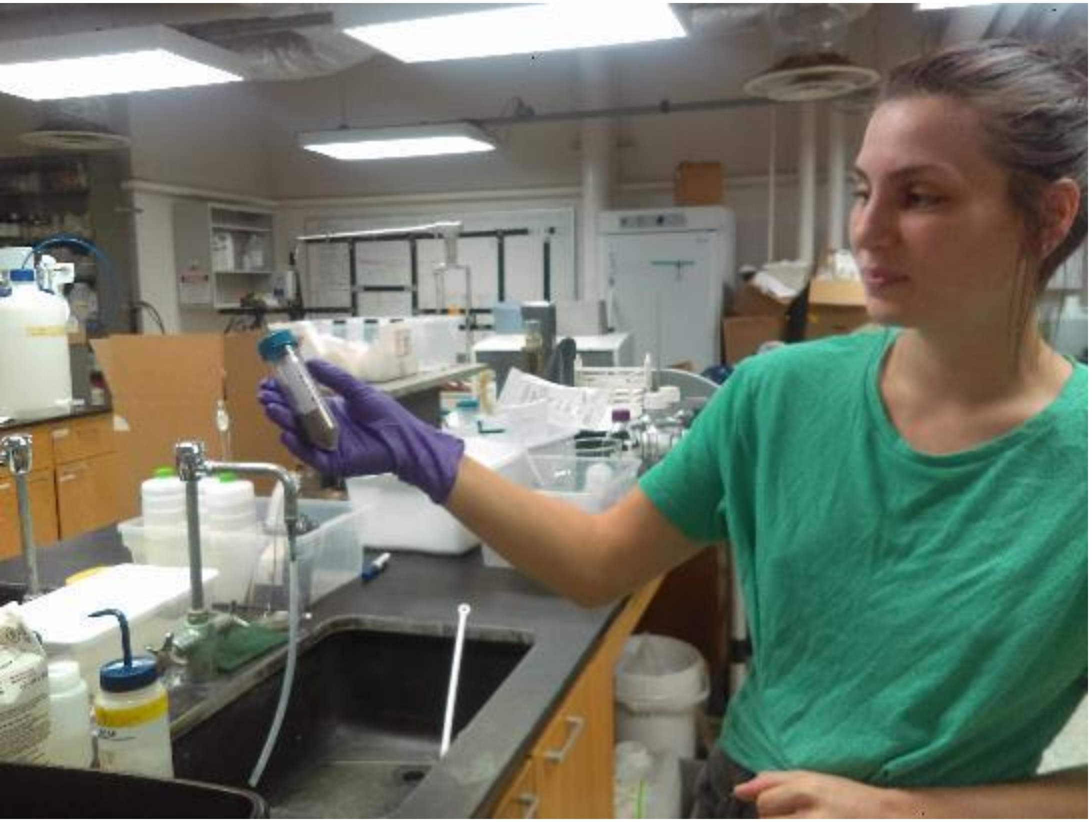
Soil Test Results	lbs/A N Credit	lbs/A P_1Bray	lbs/A K	lbs/A Mg	lbs/A Ca	lbs/A S	ppm B	ppm Zn	ppm Mn	ppm Fe	ppm Cu	ppm Mo	ppm Cl	ppm Na	ppm H	Soil pH
Available Nutrients	**0**	**10**	**373**	**535**	**5695**	**31**								**0.0**	**0.0**	**7.9**
% Base Saturation			2.8%	13.1%	84.0%									0.0%	0.0%	
Optimum Level	0	90	235	610	5083	40	2	8	50	50	3	0.4	50	< 15	5	6.5
% Base Saturation			1.8%	15.0%	75.0%									0.4%	3.0%	

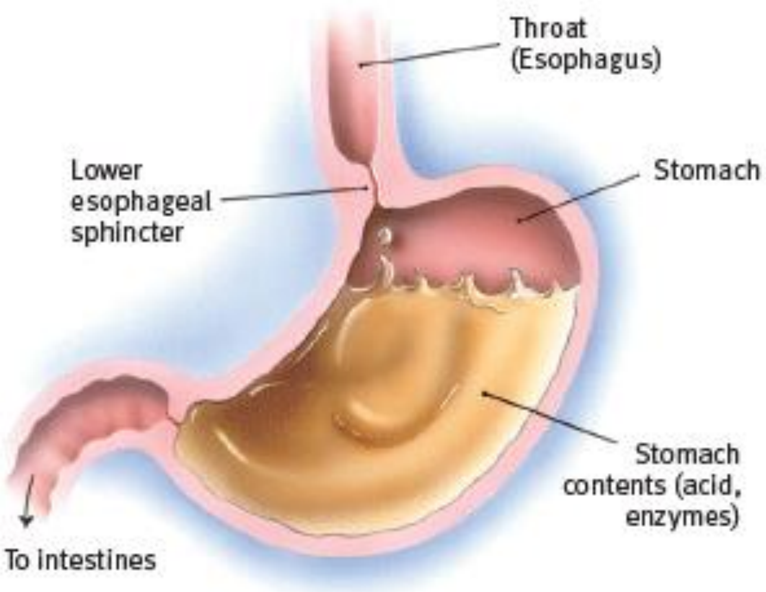
No Crop Specified	lbs/A N	lbs/A P_2O_5	lbs/A K_2O	lbs/A Mg	lbs/A Ca	lbs/A S	lbs/A B	lbs/A Zn	lbs/A Mn	lbs/A Fe	lbs/A Cu	lbs/A Mo	lbs/A Cl	Organic Matter %	CEC meq/100g	TI Salts mmhos/cm
Crop Uptake	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	7.0%	16.9	
Crop Removal	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	lbs/A Gypsum	lbs/A Lime	Buffer pH
Recommendations	0	0	0	0	0	0									0	

COLLECTING SAMPLES



TESTING BIOACCESSIBILITY





INTERVENTION

FALL/WINTER 2018

SUMMER 2019

PRELIMINARY RESULTS

- 202 parcels tested for lead
- 3 citizen scientists trained
- ~250 residents trained on safe handling of soils
- 142 sites received soil quality improvements

PRELIMINARY RESULTS

When we:

- Increase the organic matter content 1%, an 8.6% decrease in *in vitro* bioaccessible lead, on average can be expected.

eco WORKS

PRELIMINARY RESULTS

When we:

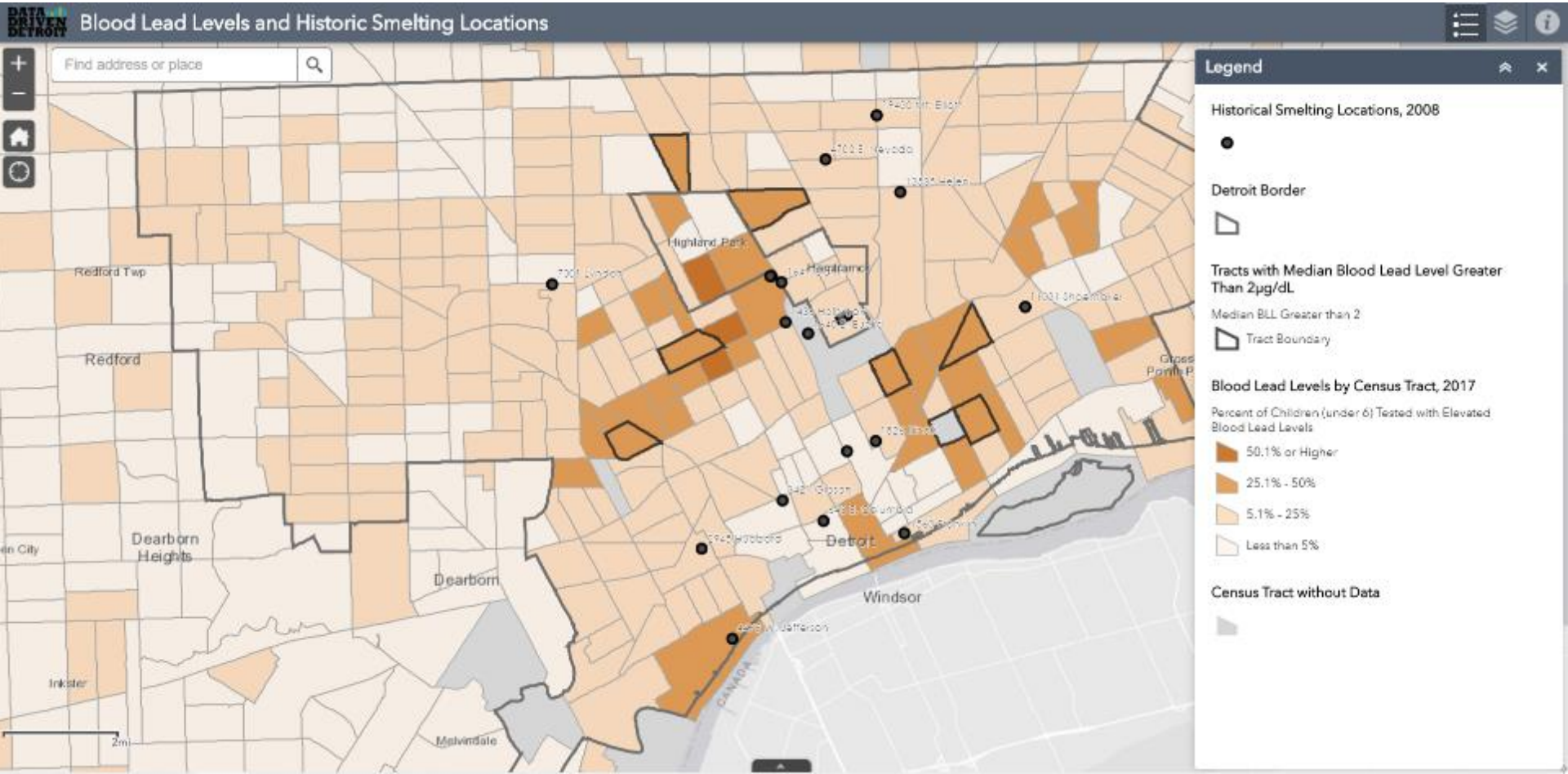
- Decrease the soil pH 0.1 units, a 10.7% decrease in *in vitro* bioaccessible lead, on average can be expected

PRELIMINARY RESULTS

The treatment resulted in a 9.8% decrease in *in vitro* bioaccessible lead.

Translates to an expected reduction in BLLs of ~1ug/DL

SMELTER LEAD < AUTOMOTIVE LEAD



STUDY GOALS – ROUND 2

- Leaching study
- Lot treatments on 45 lots
- Community education
- Treatment protocol and business plan
- Dissemination to policy makers and scientific community

QUESTIONS

Allison Harris

c. 313-242-7045

arharris@
ecoworksdetroit.org

Learn more about our soil lead study:

ecoworksdetroit.org/soilleadproject