Kickapoo Tribe in Kansas
Region-7 EPA
CWA Sec. 104 (b) (3) Wetland Program Development Project

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Environmental Director

What the Kickapoo Tribe in Kansas (KTIK) Wetland Program Does

- The Kickapoo Tribe Environmental Office (KEO) Wetlands Program monitors and assesses wetlands on tribal and surrounding lands.
- Information obtained is used to develop and implement plans to improve the quality of these wetlands and promote the restoration of historic wetland sites.

Introduction/History of the Wetlands Program Development Project

- In 1994 the Kickapoo Tribe engaged in wetland program plan development, and an outside contractor was hired to create a Phase I plan for the Tribe.
- In 1996 another contractor (White, Martin & Associates, Inc.) prepared a Phase II Wetland Conservation Plan and completed an inventory of wetlands on tribal-owned land.
- Approximately 123 wetlands were found to fall within tribally owned properties.

Problem Definition/Background

- Nearly 73% (4890 acres) of the KTIK tribal land is used for agricultural purposes, making agriculture the most important factor to be considered while making decisions regarding the watershed.
- The KTIK is concerned about using pesticides, herbicides, insecticides, and nutrient runoff from fertilizer application because the primary source of drinking water is the Delaware River.
- Wetlands can be valuable tools in helping to minimize the impact of agriculture on the KTIK drinking water, but we need first to understand their current conditions and functions.

Introduction/History of the Wetlands Program Development Project

- Of the 123 wetlands found, most were determined to be farm/stock ponds or waste treatment lagoons.
- However, there were approximately 35 emergent wetlands located, of which only nine were considered to have minimal impacts from human development/use.
- In addition to the emergent wetlands, there were also approximately 24 forested wetland areas.
- These areas fared better, as only half of them were impacted by human development.
- Lastly, there were two shrub-scrub wetlands found on the reservation's eastern boundary.

Introduction/History of the Wetlands Program Development Project

- Since the initial survey of wetlands on the Reservation in 1996, very little has been done to determine the wetlands' condition or function.
- The KEO has since been awarded grant funding by the US Environmental Protection Agency under the Wetland Development Program Grant to develop the KEO's environmental capacity, conduct assessments, and monitor the Tribe's wetland resources.

Introduction/History of the Wetlands Program Development Project

- Mapping the wetlands on the reservation is the first step in achieving no net loss of wetland quality and quantity.
- Information will also assist the KEO's other water quality programs. It will enhance the Tribe's ability to make sound decisions to protect its water resources and overall ecosystem health on the reservation.

Introduction/History of the Wetlands Program Development Project

- The KEO recognizes the importance of wetlands in reducing pollution, maintaining properly functioning watersheds, and increasing ecosystem health.
- However, a lack of up-to-date information stands between the KEO and better management practices.

History of the Wetlands Program Development Project

- Knowing where wetlands are located is the critical first step to manage better the limited water resources available to the Kickapoo Tribe.
- It is also unknown what condition or functions the wetlands on the Kickapoo Reservation perform.
- Without this information, it would be challenging to implement restoration or protection projects, create constructed wetlands, and improve our water resources condition.

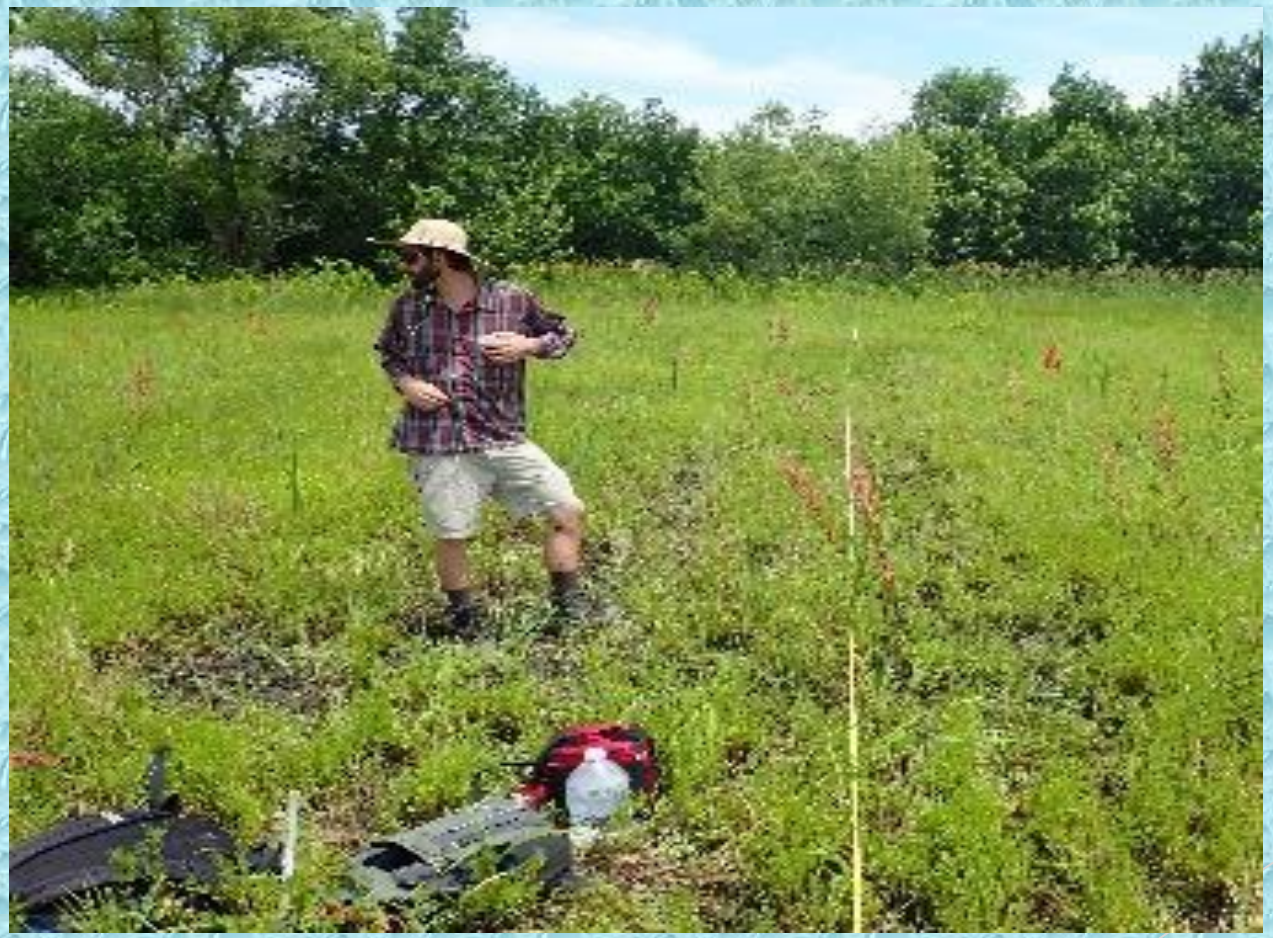
Ready to explore the KTIK Wetland areas to get soil and vegetation samples (August 2019) In the photograph: Jessica Raley and Nestoria Wright

Jessica Raley Wetland Program Coordinator and Frank Norman

Frank Norman and KEO Staff cont...

Frank Norman and KEO Staff Conducting Kickapoo Tribal Wetland Assessment

Frank Norman and Staff Conducting Kickapoo Tribal Wetland Assessment



Frank Norman and Staff Conducting Kickapoo Tribal Wetland Assessment

The core elements that the Kickapoo Environmental Office (KEO) address with the implementation of this Wetland Program Plan are:

- Monitoring and Assessment
- Wetland Restoration and Protection
- Wetland Water Quality Standards
- Wetland Regulatory

Core Element: Monitoring and Assessment

Action (ESTP CEF Objective/Action)	Activities	2020	2021	2022	2023	2024	Possible Partners	Potential Funding
Monitor Wetland resources as specified in strategy (Obj 2, Action b)								
	Track selected monitoring sites	X	X	X	X	X	NEC	PPG, GAP, 319, 5 star, NLC
	Update wetland inventory to monitor acreage and condition		X		X		COE, NRCS, HINU	PPG, GAP, 319, 5 star, NLC
	Evaluate wetland function for BMP recommendations		X	X	X	X	NRCS, HINU, KDWPT, KFS, KWO	PPG, GAP, 319, 5 star, NLC
	Evaluate monitoring and assessment strategies to ensure they meet long term wetland resource goals	X		X		X	NRCS, HINU, KDWPT, KFS, KWO	PPG, GAP, 319, 5 star, NLC
Track monitoring data in a system that is accessible, updated on a timely basis, and integrated with other state or tribal water quality data (Obj 2, Action b)								
	Integrate NWCA data with other water quality data systems (e.g., state watershed planning databases)	X	X	X	X	X	KEO, AWQMS	PPG, GAP, 319, 5 star, NLC

Core Element: Restoration & Protection

Action (ESTP CEF Objective/Action)	Activities	2020	2021	2022	2023	2024	Possible Partners	Potential Funding
Consider watershed planning, wildlife habitat, and other objectives when selecting restoration/ protection sites **(Obj 1, Action b)**								
	Share priorities with other water quality protection programs, e.g., identify riparian restoration projects that would reduce sediment and nutrient loadings to streams and implement TMDLs	X	X	X	X	X	KEO, region 7 tribes	PPG, GAP, 319, 5 star, NLC
	Identify rare, vulnerable, or important wetlands and prioritize for restoration/protection		X		X		AWSM, HINU, KDWPT, NRCS	PPG, GAP, 319, 5 star, NLC
Clearly and consistently define restoration and protection goals throughout state or tribal territory (Obj 1, Action c)								
	Develop restoration and management guidance specific to wetland types and location (e.g. urban vs. rural)		X		X		WRAPS, ASWM, CD, HINU, KFS, NRCS	PPG, GAP, 319, 5 star, NLC
	Establish measures of restoration success, e.g., adopt functional and/or condition indicators and field methods		X		X		WRAPS, ASWM, CD, HINU, KFS, NRCS	PPG, GAP, 319, 5 star, NLC

Core Element: Wetland Water Quality Standards

Action (ESTP CEF Objective/Action)	Activities	2020	2021	2022	2023	2024	Possible Partners	Potential Funding
Compile wetland data to use as reference should the Tribe decide to develop wetland specific water quality standards (Obj 2, Action a)								
	Continually search for additional sites that can be used to gather more wetland water quality data	X	X	X	X	X	KEO	PPG, GAP, 319, 5 star, NLC
	Continue to sample selected tribal wetlands	X	X	X	X	X	Other KEO programs	PPG, GAP, 319, 5 star, NLC
	Create appropriate wetland water quality standards to better manage the Tribe's wetland resources	X	X	X	X	X	KEO, KWO, KDHE	PPG, GAP, 319, 5 star, NLC

Core Element: Wetland Regulatory

Action (ESTP CEF Objective/Action)	Activities	2020	2021	2022	2023	2024	Possible Partners	Potential Funding
Develop definitions and jurisdictional scope in case the Tribe decides to develop wetland specific regulatory program (Obj 1, Action a)								
	Develop a working definition of what the Tribe considers a wetland	X					KDHE, KWO, region 7 tribes	PPG, GAP, 319, 5 star, NLC
	Develop definitions involving Tribal waters	X					Other KTIK programs, region 7 tribes	PPG, GAP, 319, 5 star, NLC
Perform public education and outreach about wetland protection, regulated waters and activities, and authorization process (Obj 3, Action e)								
	Distribute brochures, flyers etc. at community events	X	X	X	X	X	Local community	PPG, GAP, 319, 5 star, NLC
	Present at local schools or community events on the importance and functions of wetlands	X	X	X	X	X	KNS, Local schools	PPG, GAP, 319, 5 star, NLC
	Utilize the Kickapoo website to share information on wetlands and projects	X	X	X	X	X	KTIK	PPG, GAP, 319, 5 star, NLC

Objectives of the Wetlands Program Development Project

- The overall goal of the 2018-2019 Wetlands Program Development Project is:
  - Conducting assessment and evaluation of the overall wetland utility of the eight wetlands within the Kickapoo Tribe's boundaries that are still relatively unaltered by human activity - as well as the reference site, Muscotah Marsh.
  - Conducting and attending training on applying the National Wetland Condition Assessment (NWCA) methods to complete remaining assessments.
  - Acquiring a deeper understanding of the local wetland health and function.

The wetlands program has collected the following data:

- Location, wetland size, type of water body, hydrology, soils,
- Land use, impacts on wetland,
- Inventory of noxious and invasive weeds, cultural plants, wetland plants,
- Potential wetland functions and values, fluctuations in groundwater levels, water quality parameters

NWCA Results

Water analytical results:
Site 104 -1
Lab ID 1220355
Date Collected: 8/13/2019
Pesticides method: EPA 8080

Chemicals Tested

Parameters
Methoxychlor
PCB-1016
PCB-1221
PCB-1232
PCB-1242
PCB-1248
PCB-1254
PCB-1260
Toxaphene

Endosulfan I
Endosulfan II
Endosulfan Sulfate
Endrin
Alpha-BHC
Beta-BHC
Delta-BHC
Gamma BHC (Lindane)
Heptachlor
Heptachlor Epoxide
Hexachlorobenzene
Hexachlorocyclopentadiene

Aldrin
Chlordane
DCPA (Dacthal)
p,p'-DDD
p,p'-DDE
p,p'-DDT
Dieldrin

ALL RESULTS ARE BELOW RDL w/ 1 DF

Water Analytical Results

Site 104 -1
Lab ID 1220355
Date Collected: 8/13/2019
Pesticides method: EPA 8080

Pesticides above RDL:

- Acetochlor = 1.459 ug/L.
- Deisopropyl Atrazine = 0.627 ug/L.
- Dual (Metolachlor) = 1.254 ug/L.

*Reporting limit at Kansas Health and Env. Labs is 0.1 ug/L

Sample ID: 104 -2

Lab ID 1223117

Date Collected: 8/13/2019

Parameters	Results	RDL	DF	Prep
Total Organic Carbon	13 mg/L	.50	1	SM 5310-C

or 1.3% OM

Site 104 - 4

Lab ID 1223101

Date Collected: 8/13/2019

Parameters	Results	RDL	DF	Prep	Analyzed
Ammonia	<.10 mg/L	.10	1	EPA 350.1	8/29/2019
Total Kjeldahl Nitrogen	.89 mg/L	.20	1	EPA 351.1	8/21/2019
Total Phosphorus	.84 mg/L	.20	1	EPA 365.1	8/30/2019

Site 104 - 5

Lab ID 1223112

Date Collected: 8/13/2019

Parameters	Results	RDL	DF	Prep
Turbidity	5.6 NTU	0.15	1	EPA 180.1

Ion Chromatography

Parameters	Results	RDL	DF	Prep
Nitrate (measured as N)	<.10 mg/L	.10	5	EPA 300
Chloride	2.0 mg/L	1.0	5	EPA 300
Nitrite (measured as N)	<0.050 mg/L	0.050	5	EPA 300
Sulfate	10mg/L	0.50	5	EPA 300

Chlorophyll a results:

Site NWCA19-104
Sample # 999001

Parameters	Sample size	Results
Chlorophyll-a	250 mL	4.96 ug/L

Floristic Quality Assessment (FQA)

Site ID	Mean c-value	FQAI
101	2.08	12.50
103	1.20	7.10
104	1.79	11.57
105	1.86	9.83
106	2.82	20.16
107	1.34	7.24
108	0.90	2.85
109W	2.40	16.60
Muscotah	3.83	20.61

Floristic Quality Assessment (FQA)

- The FQA analyzes ecological value of wetland in relation to the plant species composition, showing the overall vegetation quality of the location.

$$\bar{C}\sqrt{n}$$

  - c-value is the coefficient of conservation
    - The c-value ranges from 0 – 100
  - 1-19 value shows low vegetation quality
  - 20-35 value shows high vegetation quality
  - >35 value shows natural area quality
  - The probability of plant occurrence based on tolerance to environmental degradation
  - 0 value shows the most tolerant, normally categorized as invasive or introduced nonnative species
  - 10 value shows the least tolerance, labeled as rare and endangered plants

Soil analysis results
Heavy metal index:

- All sites showed LOW stressors
- HMI extent was estimated for three categories: low, moderate,
- and high stressor-levels, where:
- Low = all 12 elements below background
- High = 3 or more elements were above background
- Moderate = between low and high

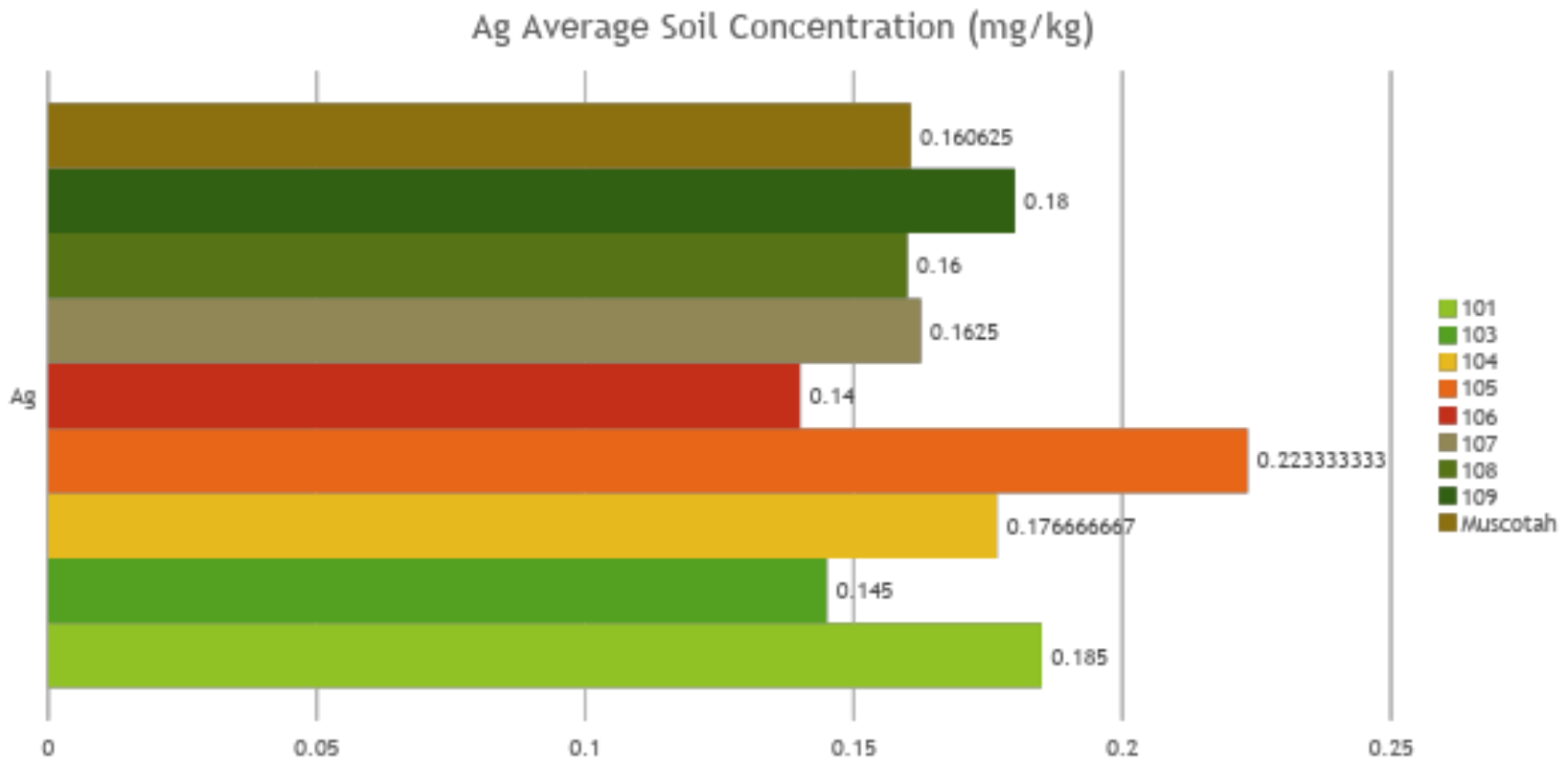
Soil analysis results:
Heavy metal index:

Indicator of Stress	Low Stressor-Level Threshold	High Stressor-Level Threshold
Heavy Metal Index	All metals ≤ background concentrations	3 or more metals > background concentrations

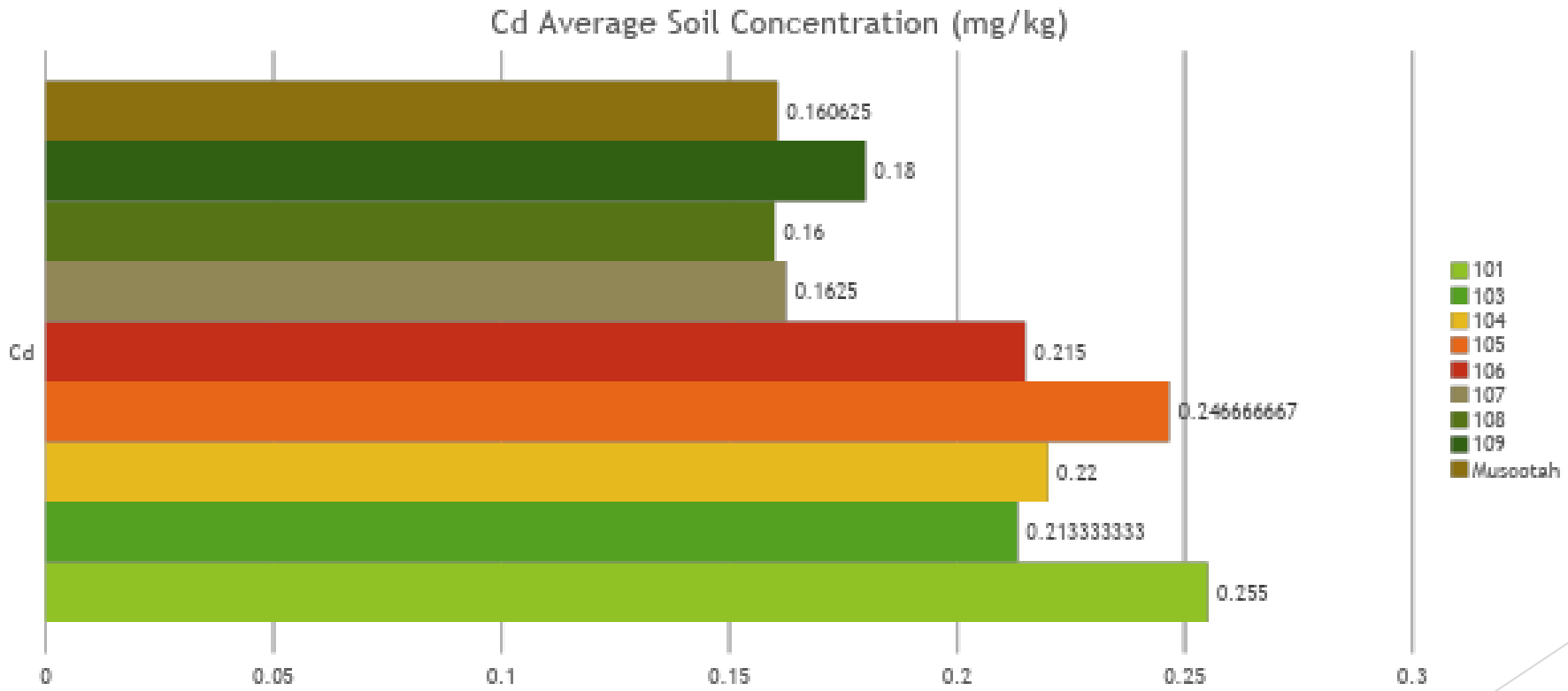
Soil analysis results: Heavy metal index

Metal	Primary Anthropogenic Association	Natural Background Concentration (mg/kg)	Stress-Level Threshold (mg/kg)
Silver (Ag)	Industry	0.05 – 1.00	1.0
Cadmium (Cd)	Agriculture	0.1 – 1.0	1.0
Cobalt (Co)	Industry	< 50	25
Chromium (Cr)	Industry	0.5 – 250	125
Copper (Cu)	Agriculture / Industry / Roads	2 – 50	50
Nickel (Ni)	Industry / Agriculture	0.2 – 450	225
Lead (Pb)	Roads / Industry	Mean of 18	35
Antimony (Sb)	Industry	0.1 – 1.9	1.0
Tin (Sn)	Industry / Agriculture	1.7 – 50	17
Vanadium (V)	Industry / Roads	36 – 150	150
Tungsten (W)	Industry / Agriculture	< 2	2.0
Zinc (Zn)	Industry / Agriculture	10 – 150	150

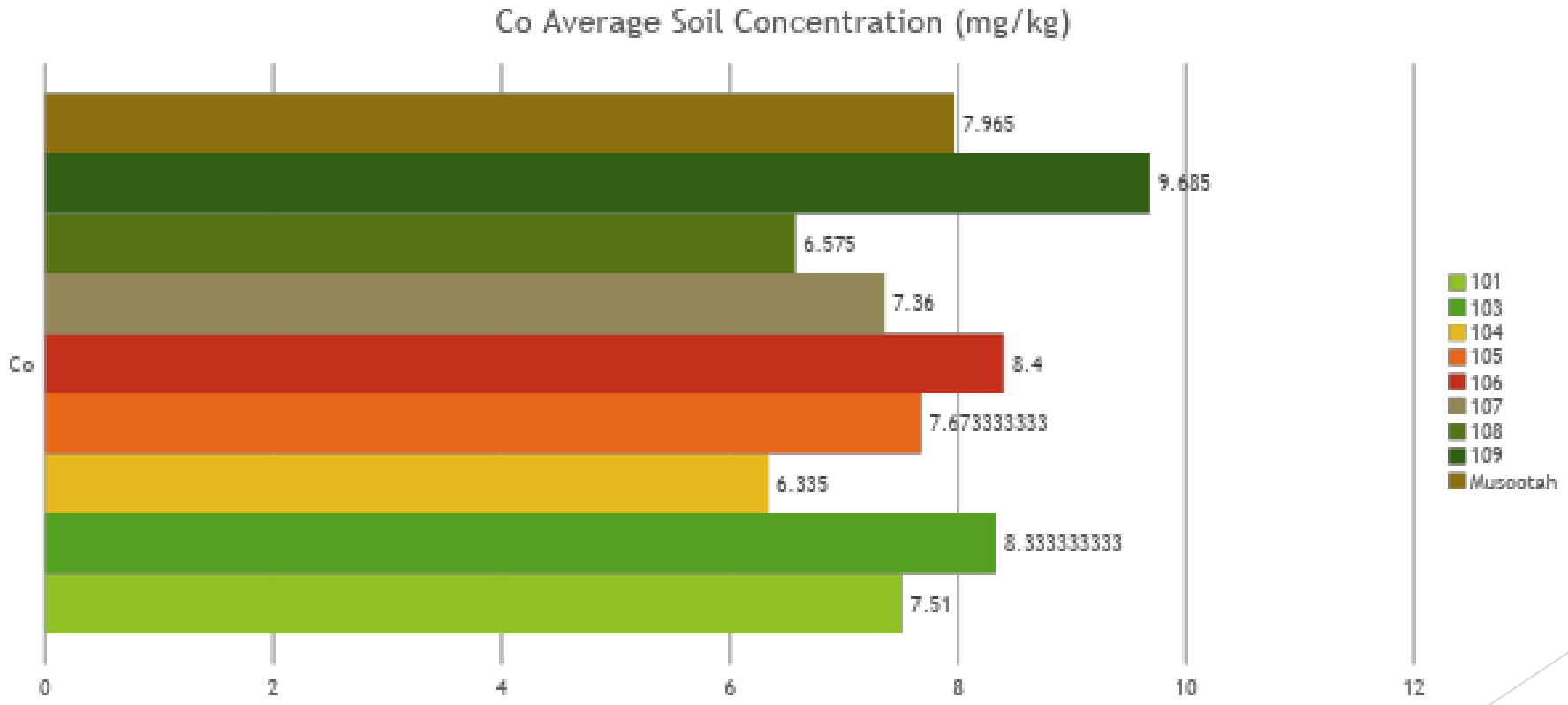
Ag Average Soil Concentration (mg/kg)



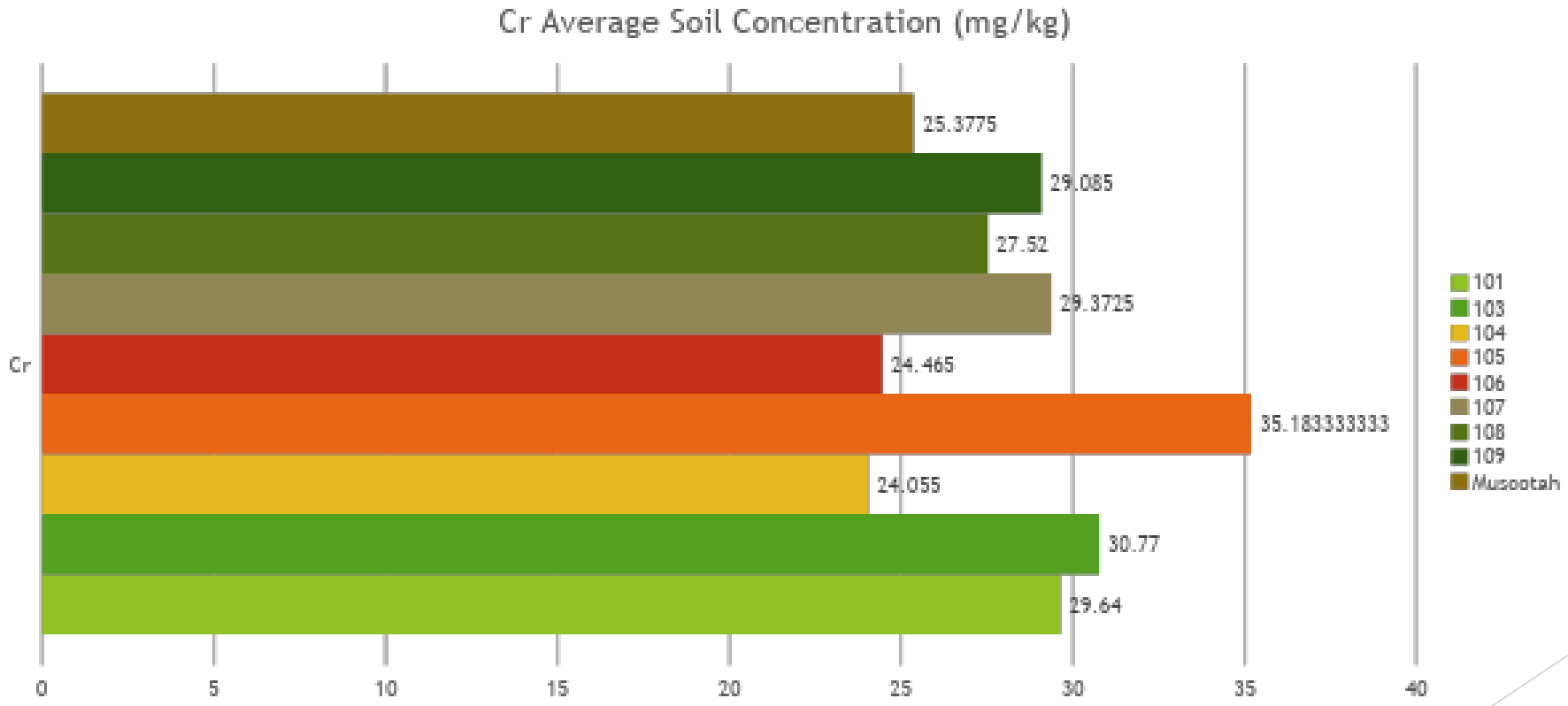
Cd Average Soil Concentration (mg/kg)



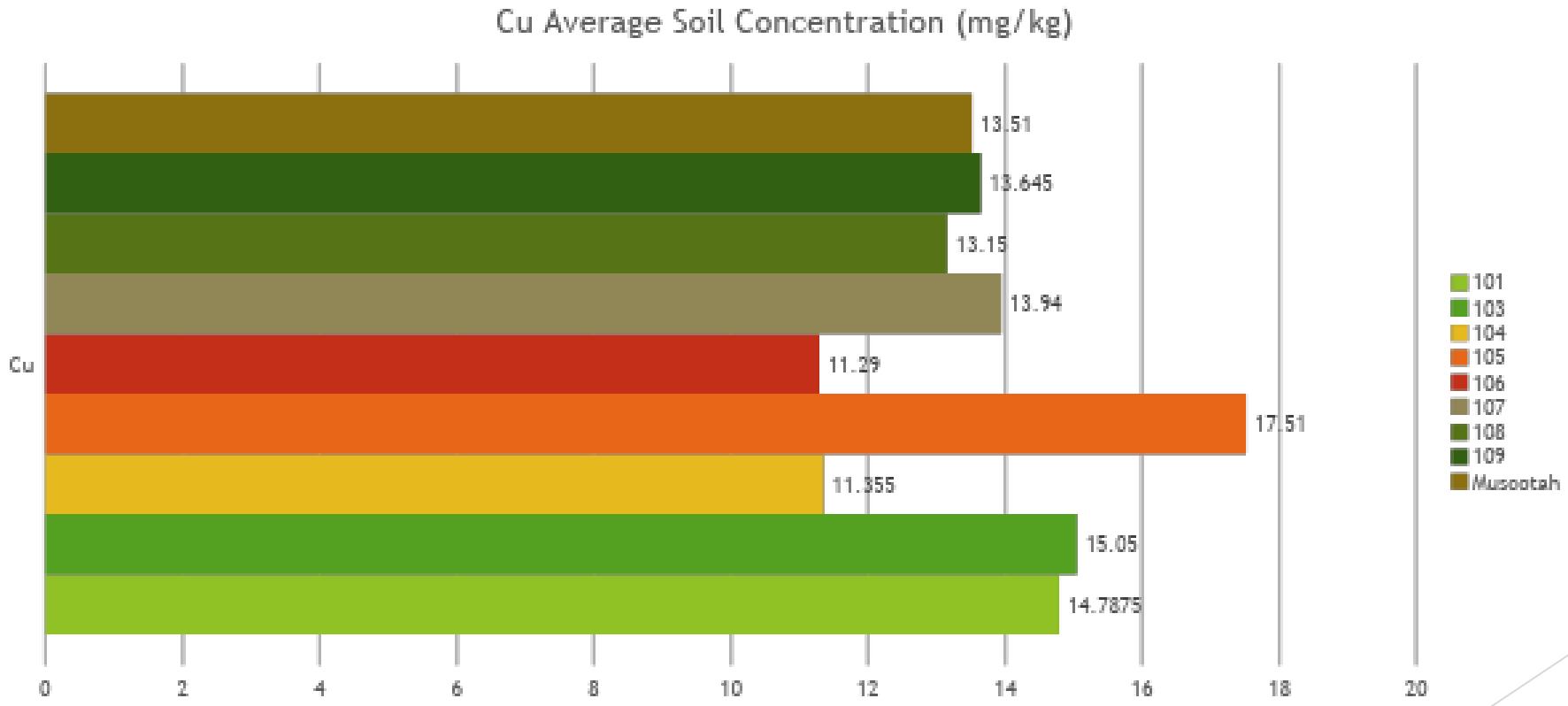
Co Average Soil Concentration (mg/kg)



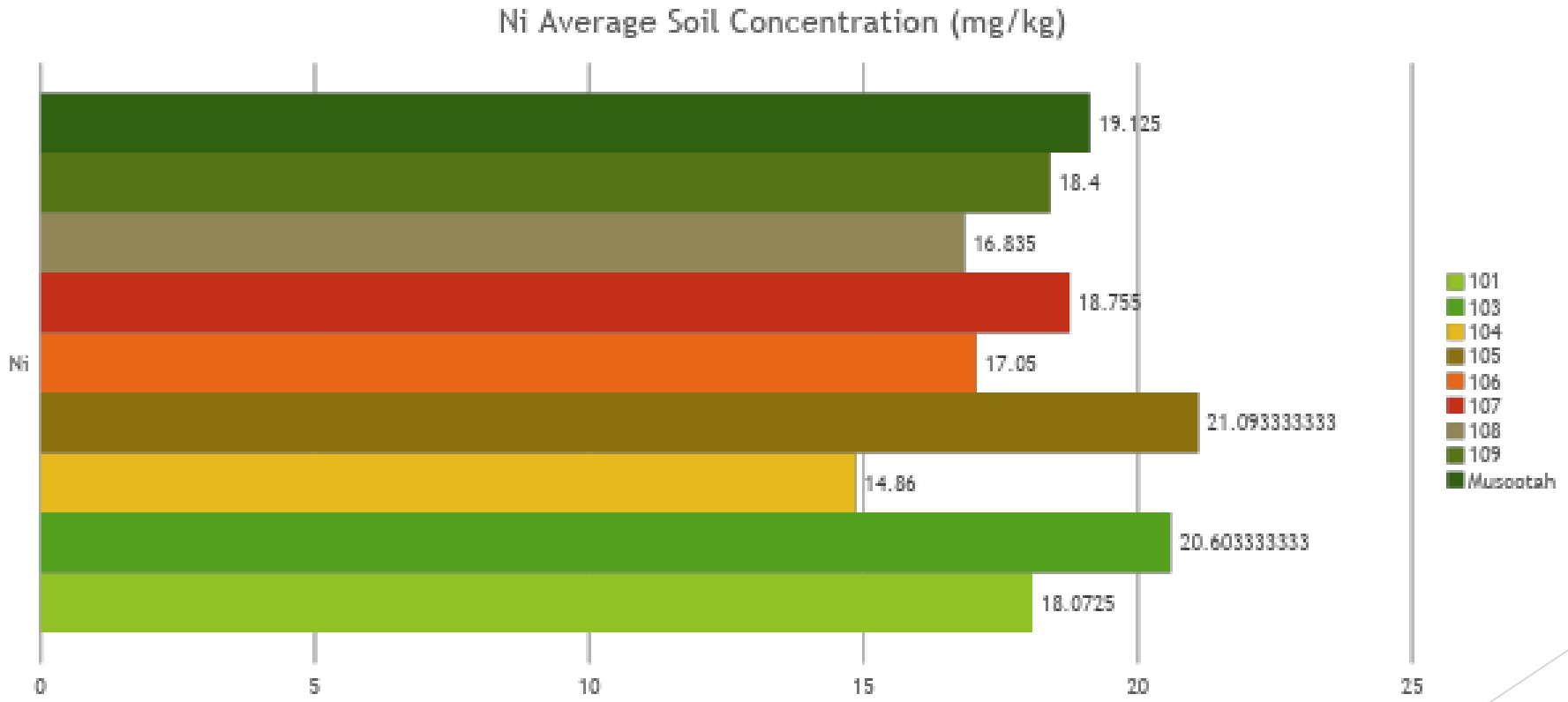
Cr Average Soil Concentration (mg/kg



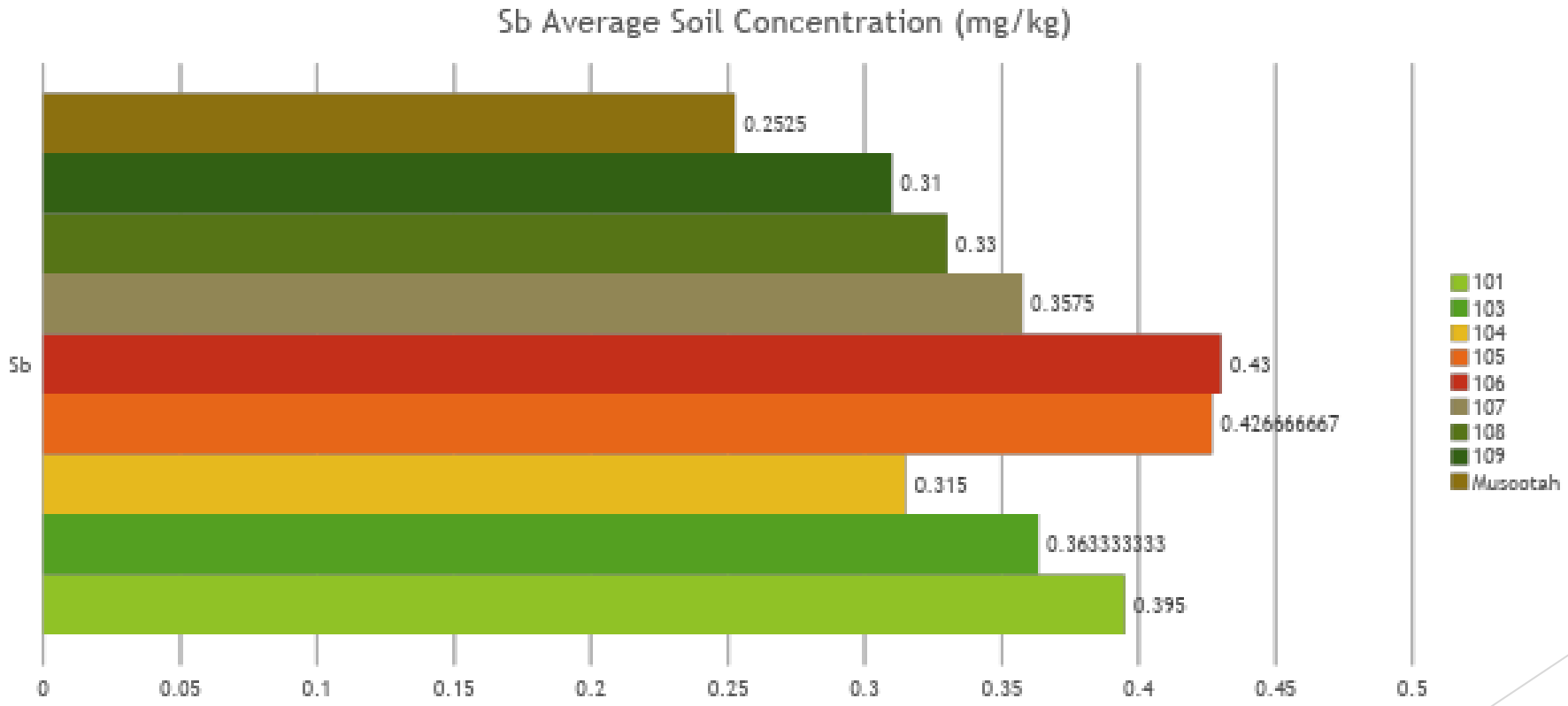
Cu Average Soil Concentration (mg/kg)



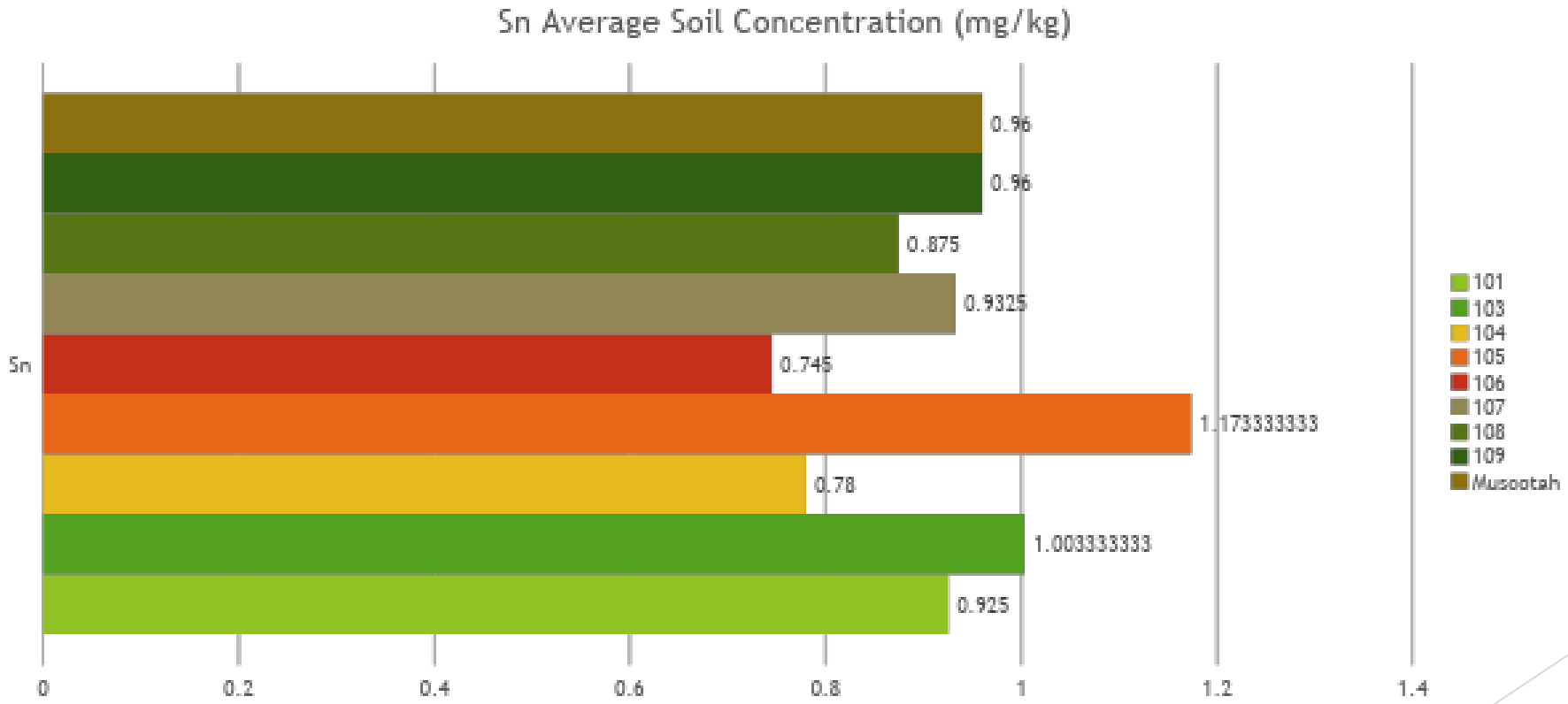
Ni Average Soil Concentration (mg/kg)



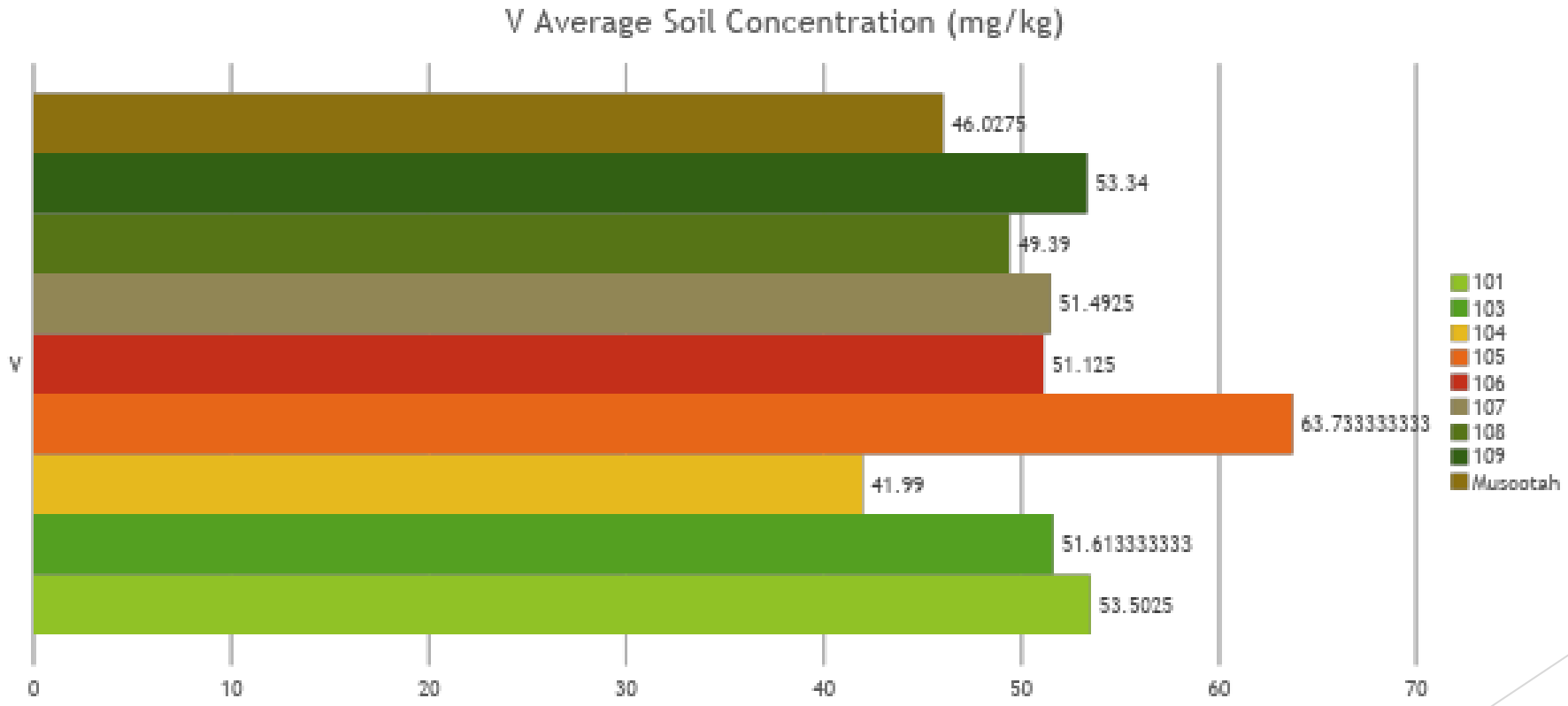
Sb Average Soil Concentration (mg/kg)



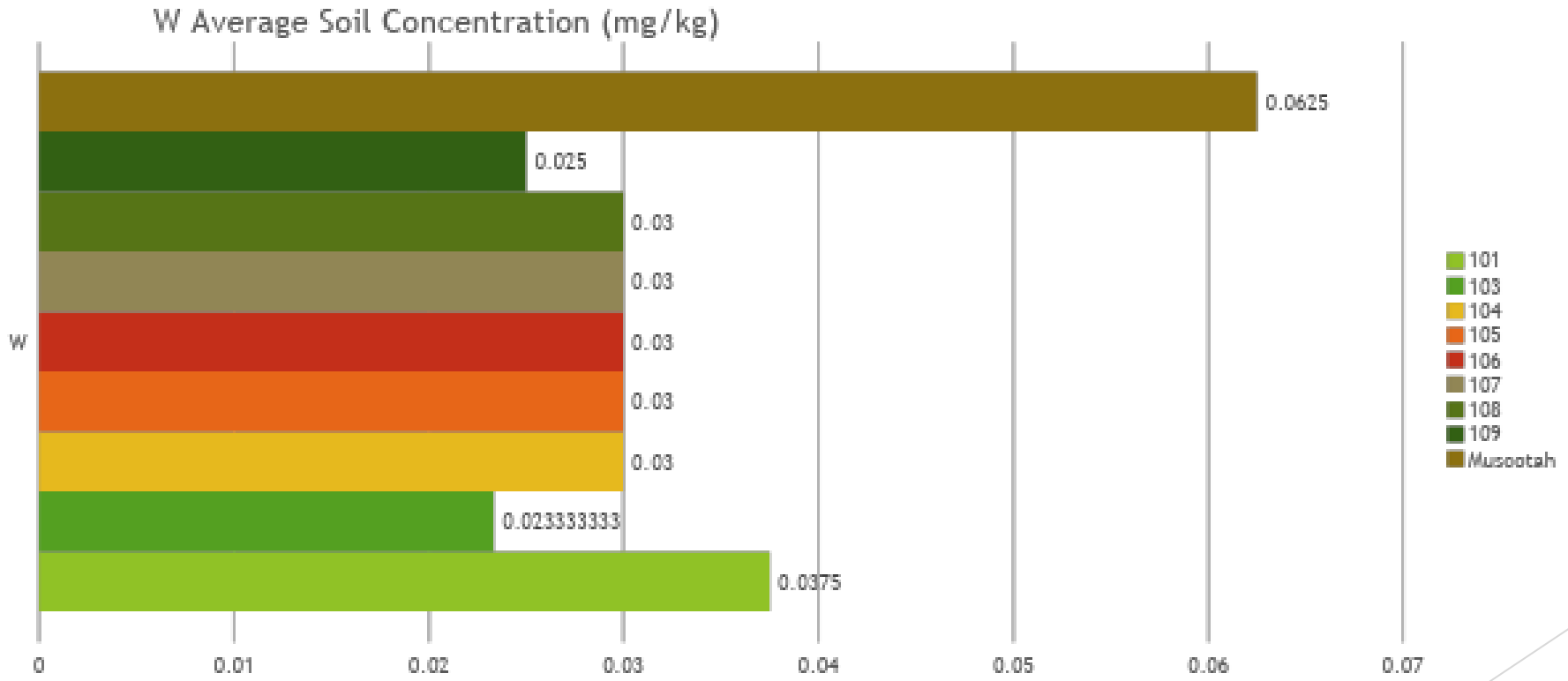
Sn Average Soil Concentration (mg/kg)



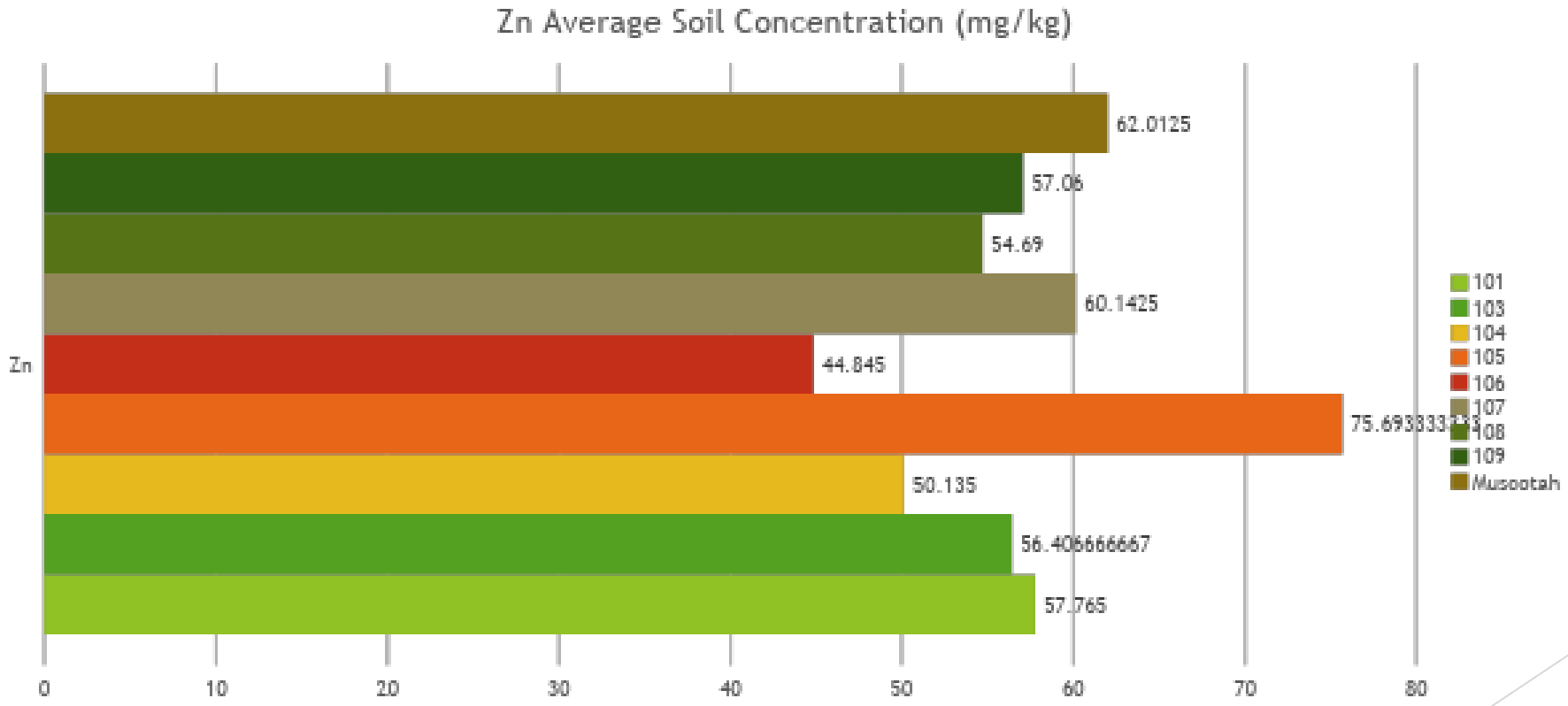
V Average Soil Concentration (mg/kg)



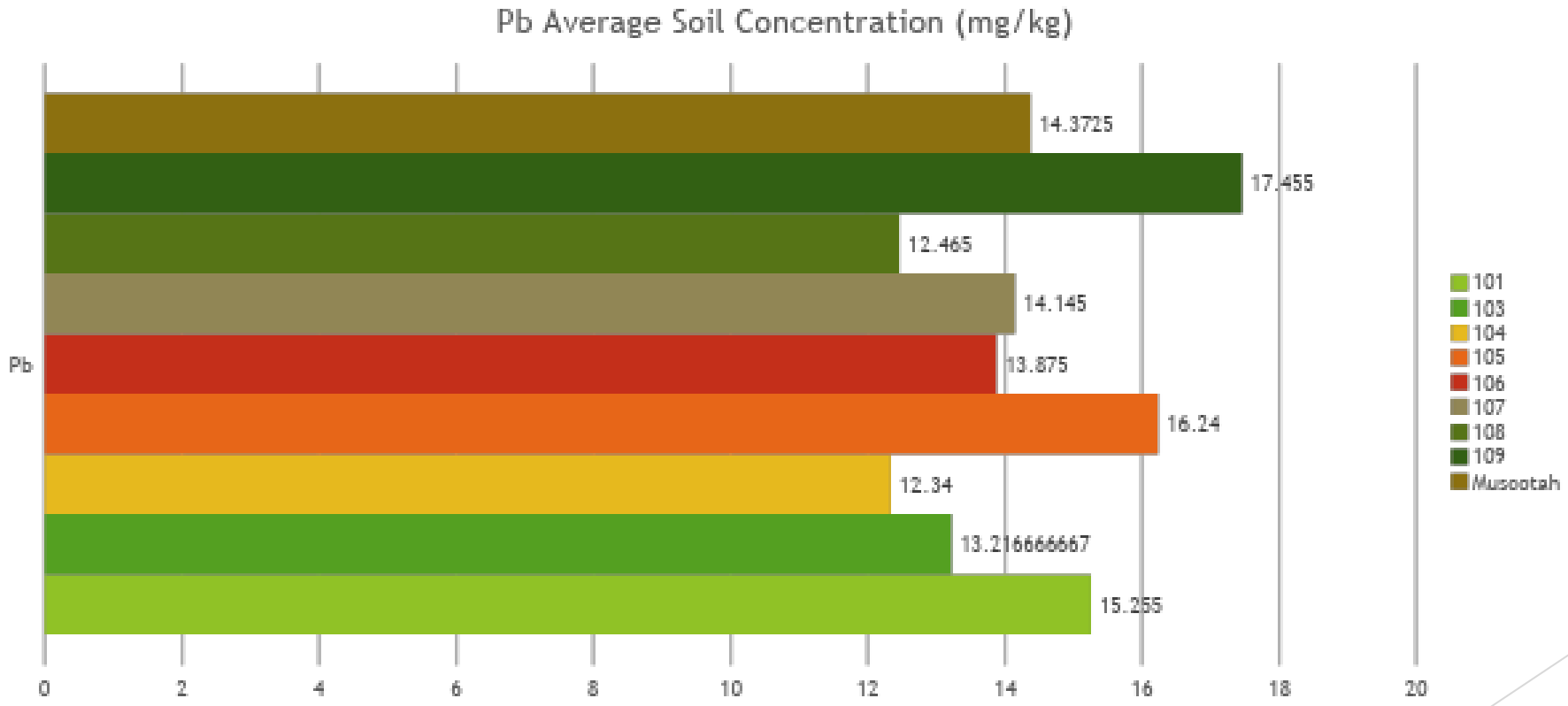
W Average Soil Concentration (mg/kg)



Zn Average Soil Concentration (mg/kg)



Pb Average Soil Concentration (mg/kg)



Phosphorus analysis results:

Stressor-Level Threshold Groups	Reporting Groups Included	Low Stressor-Level Threshold (mg P / kg soil)	High Stressor-Level Threshold (mg P / kg soil)
Estuarine	EH, EW	≤ 519	> 969
Coastal Plains	CPL-PRLH, CPL-PRLW	≤ 582	> 1180
Eastern Mountains & Upper Midwest	EMU-PRLH, EMU-PRLW	≤ 914	> 1280
Interior Plains	IPL-PRLH, IPL-PRLW	≤ 1110	> 1810
West	W-PRLH, W-PRLW	≤ 1140	> 2090

Site 101

Layer	depth (cm)	P	Low or high stress
19N03673	0.0-12.0	565.37	Low
19N03674	12.0-35.0	408	Low
19N03675	35.0-100.0	477.59	Low
19N03676	0.0-10.0	598.84	Low

Site 103

Layer	depth (cm)	P	Low or high stress
19N03677	0.0-67.0	435.52	Low
19N03678	67.0-101.0	538.52	Low
19N03679	0.0-1.0	598.18	Low

Site 104

Layer	depth (cm)	P	Low or high stress
19N03680	0.0-50.0	579.07	Low
19N03681	0.0-10.0	592.49	Low

Site 105

Layer	depth (cm)	P	Low or high stress
19N03685	0.0-0.60	430.13	Low
19N03686	0.0-10.0	440.2	Low

Site 106

Layer	depth (cm)	P	Low or high stress
19N03685	0.0-0.60	430.13	Low
19N03686	0.0-10.0	440.2	Low

Site 107

Layer	depth (cm)	P	Low or high stress
19N03687	0.0-26.0	532.71	Low
19N03688	26.0-50.0	398.34	Low
19N03689	50.0-100.0	394.56	Low
19N03690	0.0-10.0	603.91	Low

Site 108

Layer	depth (cm)	P	Low or high stress
19N03691	0.0-76.0	524.1	Low
19N03692	0.0-10.0	528.72	Low

Site 109

Layer	depth (cm)	P	Low or high stress
19N03693	0.0-55.0	536.68	Low
19N03694	0.0-10.0	581.2	Low

Muscotah

Layer	depth (cm)	P	Low or high stress
19N03695	0.0-11.1	850.96	Low
19N03696	11.0-36.0	788.92	Low
19N03697	36.0-50.0	1160.5	High
19N03698	0.0-10.0	973.62	Low

FUTURE PLANS FOR WETLANDS PROTECTION AND RESTORATION

- Initiate watershed planning efforts that include isolated or vulnerable wetlands
- Develop water quality standards for wetlands
- Develop and institute wetland regulations
- Establish partnerships that support wetland restoration
- Encourage or pursue research on the effectiveness of wetland restoration methods
- Actively pursue wetland restoration

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