


Alternative Salinity Evaluation

Description and benefits of an additional line of evidence accepted by the BC Oil & Gas Commission.



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Muskeg...Its just different. And, it's Important!

- Muskeg is biological, not mineral
- Moisture Range Typically 70% to 95%
- 11% of Canada's surface area is Muskeg
- Habitat for plants and animals

**A better way to measure and
report sodium and chloride
concentrations in muskeg**

My Goal





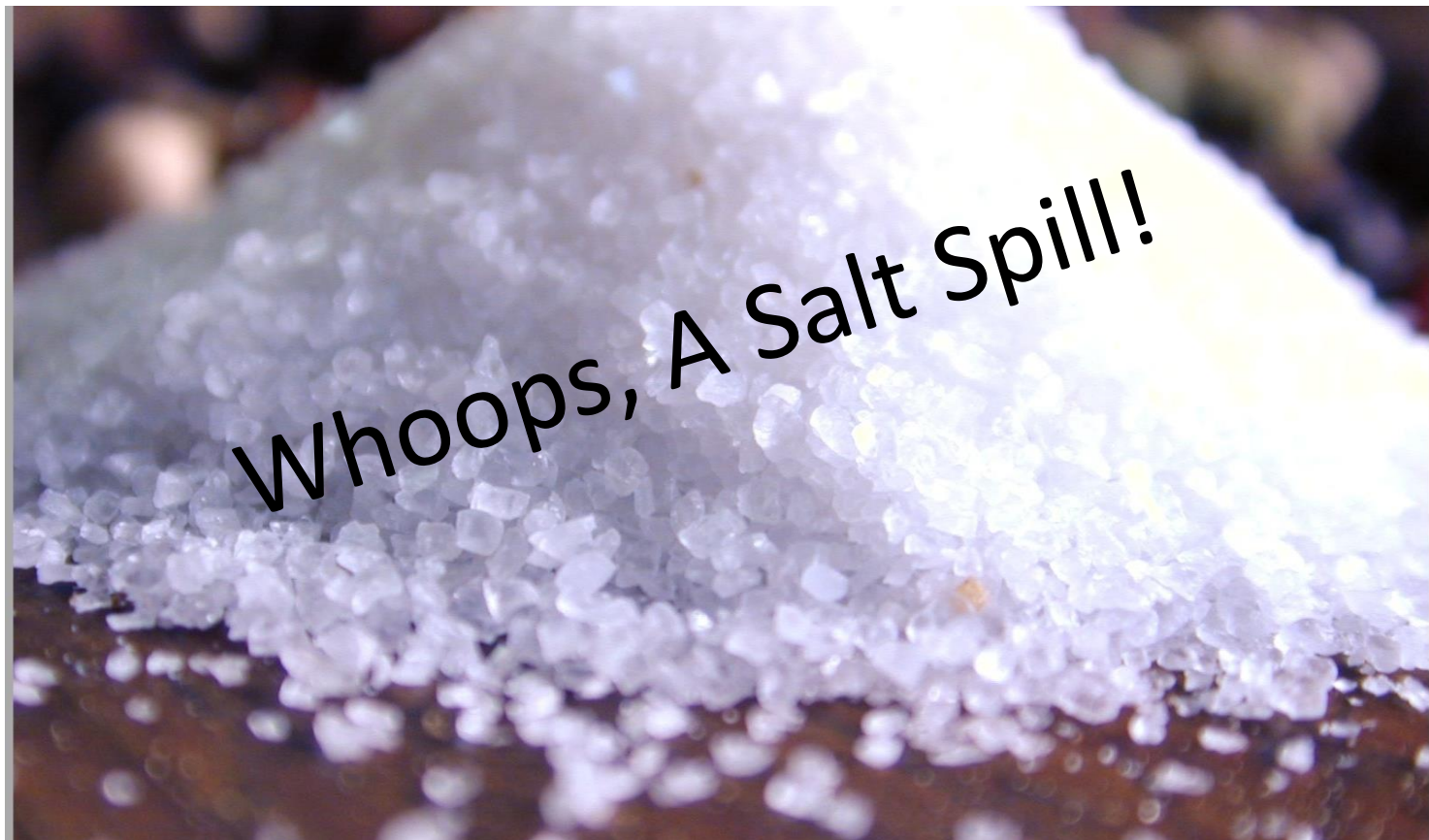
Explanation of Alternative Salinity Evaluation.

- Part 1 – what should be measured and how? This is the emphasis of my presentation
- Part 2 – new proposed guidelines.

Let's make some Muskeg

Don't worry, for those of
you with Chemistry
backgrounds, I will make
this more confusing later!





10 grams of Chloride Was Spilt
Into Our Muskeg Sample!

Sample Composition

Description	Mass
Dry Muskeg	200g
Water	800g
Dry Muskeg + Water	1000g or 1kg
Chloride	10g

What We Measure is What We Report

Notice

The numerator is the same,
but the denominator
changes. This is
Denominator Bias!

Dry Weight

$$\frac{10 \text{ g (Chloride)}}{200 \text{ g (Dry Muskeg)}} = 50 \text{ g/kg}$$

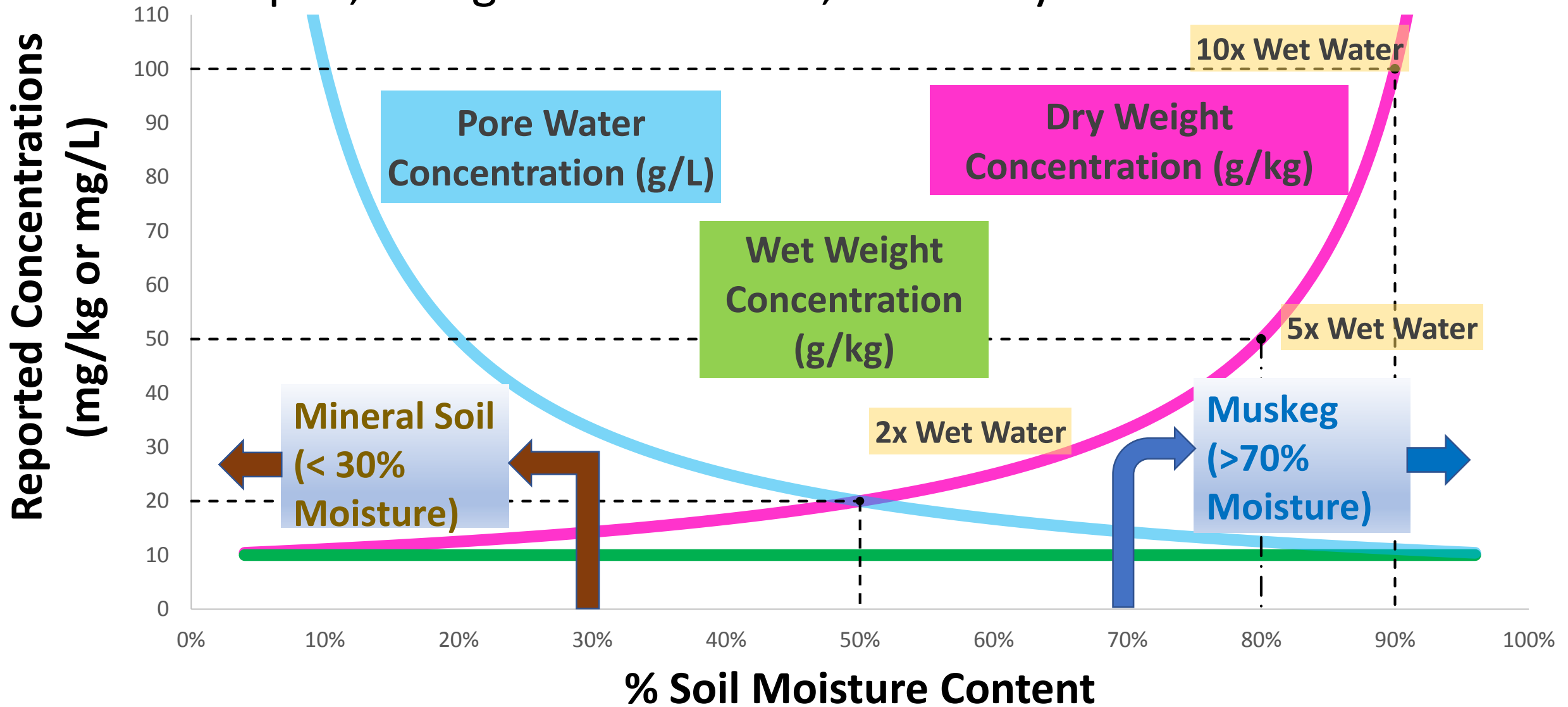
Wet Weight

$$\frac{10 \text{ g (Chloride)}}{1000 \text{ g (Wet Muskeg)}} = 10 \text{ g/kg}$$

Pore Water

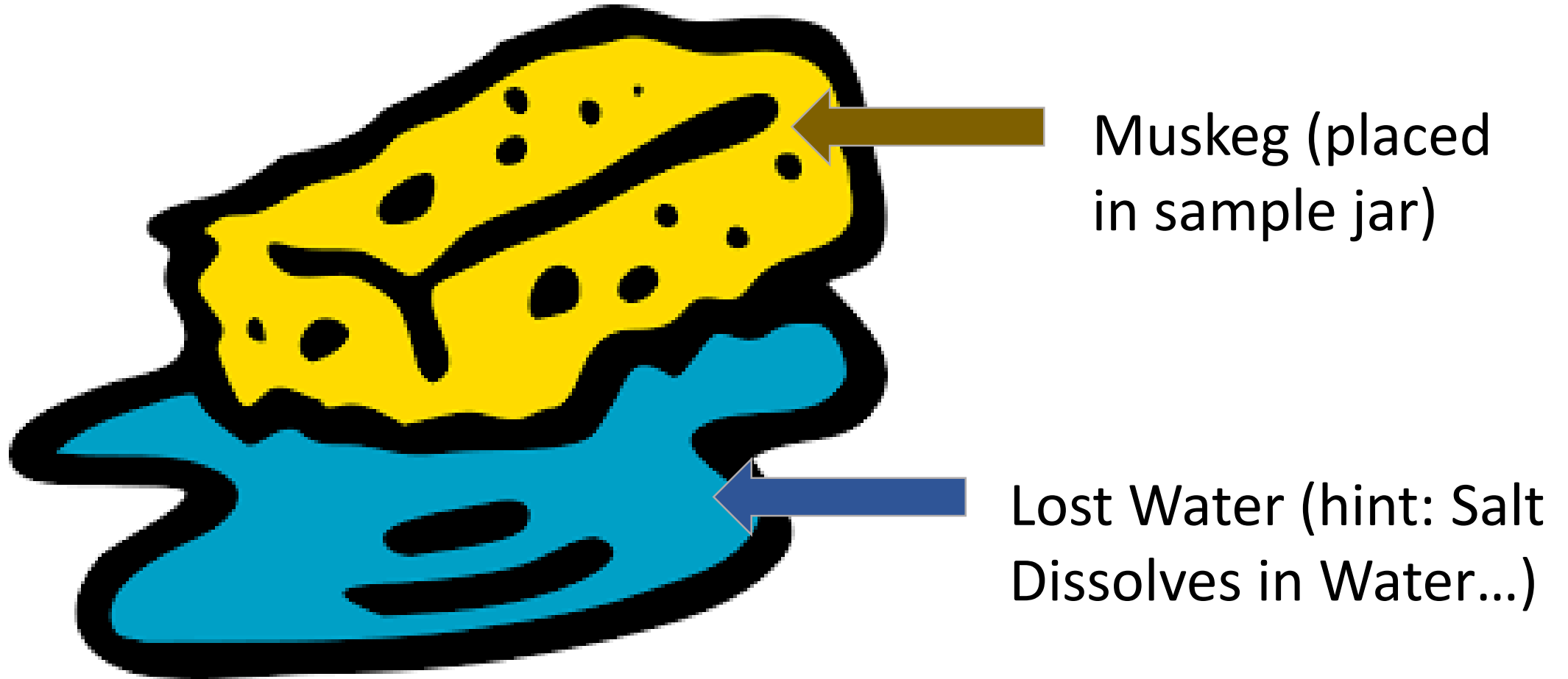
$$\frac{10 \text{ g (Chloride)}}{800 \text{ mL (water)}} = 12.5 \text{ g/L}$$

Denominator Bias: Relationship Between Reporting a Solid and a Liquid, Using Either a Water, Soil or Hybrid Measure

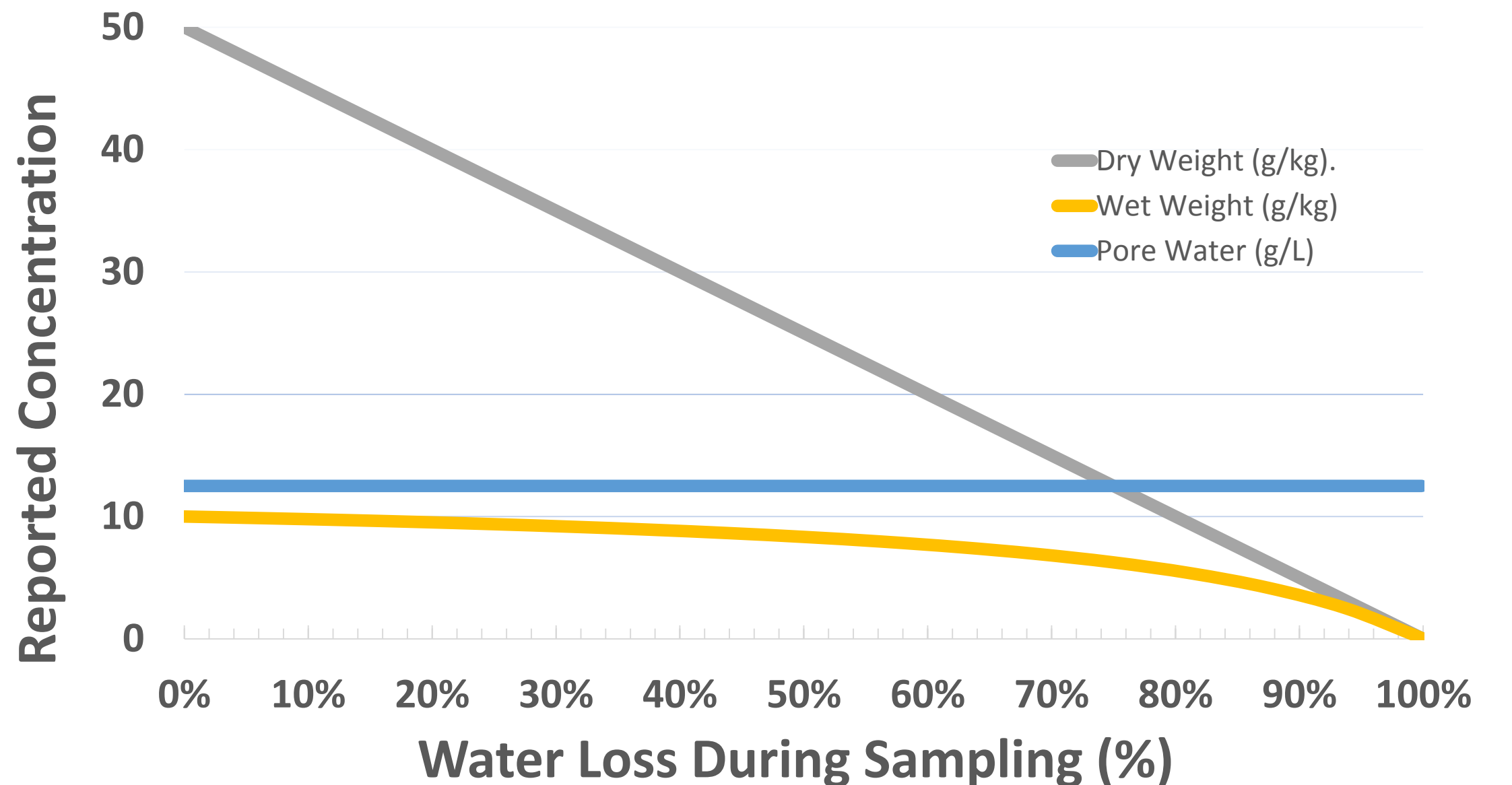


Numerator Bias:

What Happens When Water is Lost During Sampling?

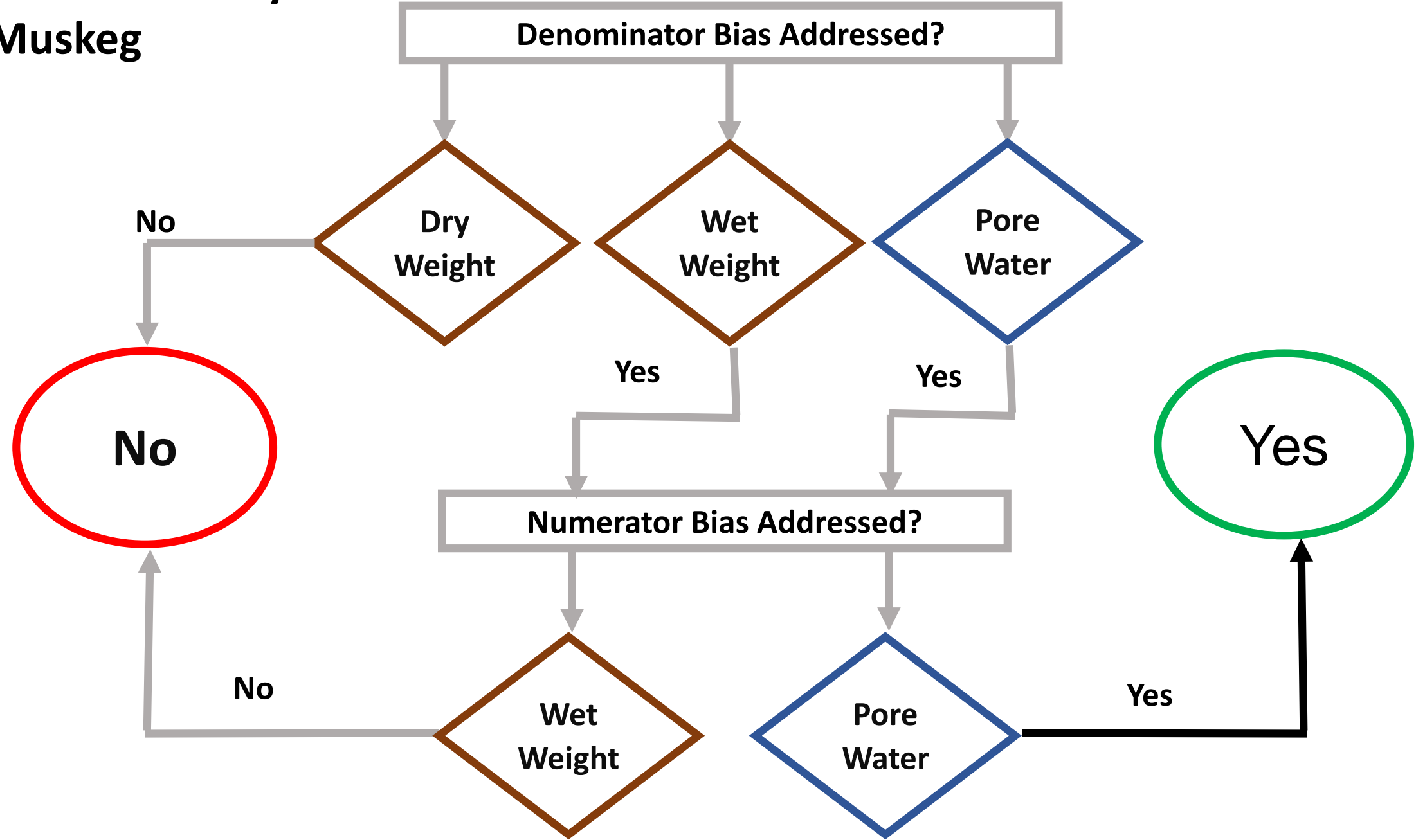


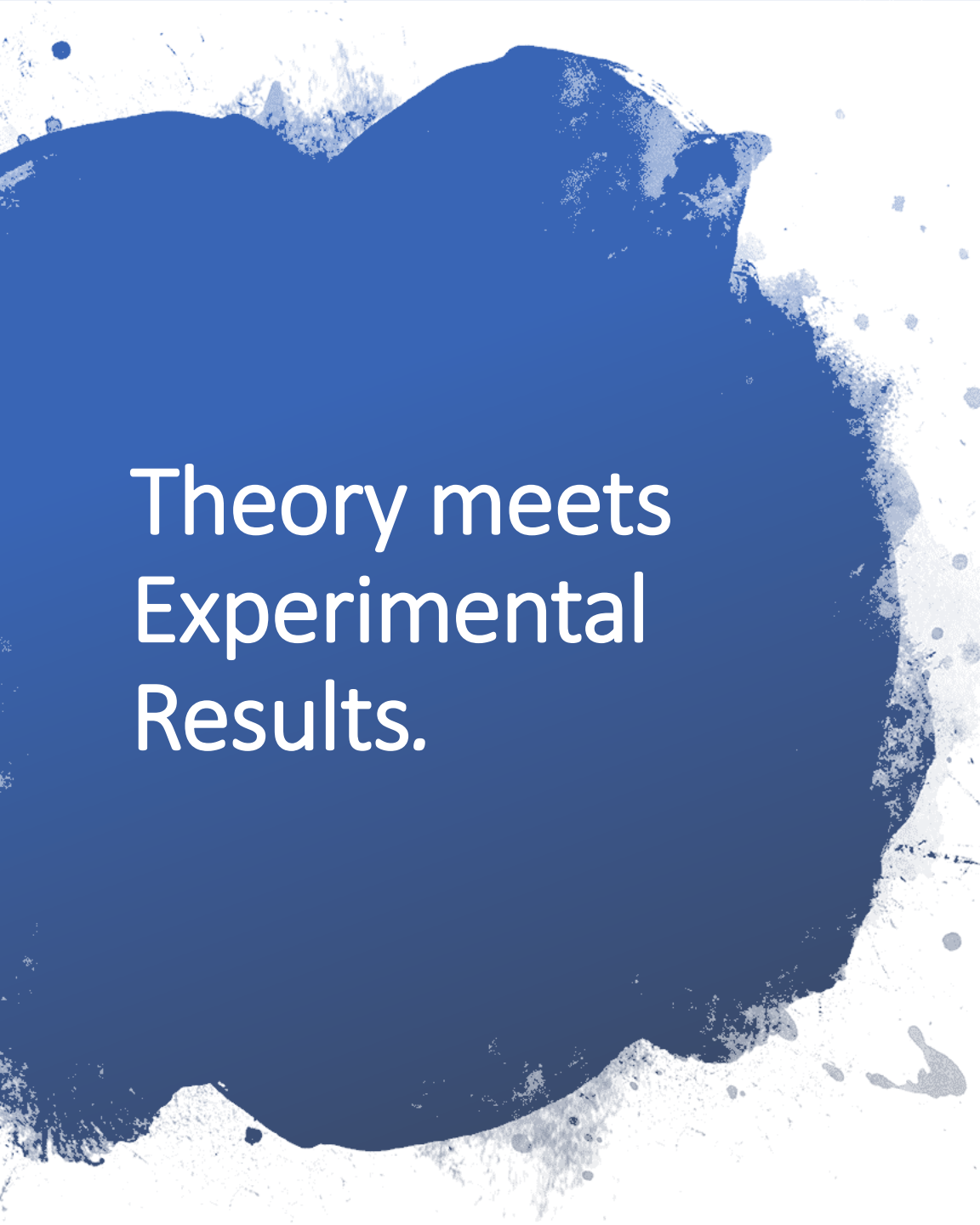
Numerator Bias: Relationship Between Water Loss During Sampling & Reported Concentration (g/kg or g/L)



Method Bias Summary

NaCl in Muskeg





Theory meets Experimental Results.

- Our experimental results identified measuring the pore water was more precise and more accurate compared to the standard Saturated Paste Method currently used by Industry.

For more information, go to:
<http://www.bcogris.ca/projects/complete>

Proposed Alternative Guidelines

Chloride:

- WLN: 1370 mg/L
- WLR / AL / RLLDR / PL: 1680 mg/L
- RLHDR / CL / IL: 2440 mg/L

Sodium:

- WLN: 890 mg/L
- WLR / AL / RLLDR / PL: 1090 mg/L
- RLHDR / CL / IL: 1580 mg/L

So What?

- Sometimes we need to truck soil
- Sometimes we need to leave nature alone





Questions

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