



Baseline Surface Water Quality Monitoring Program

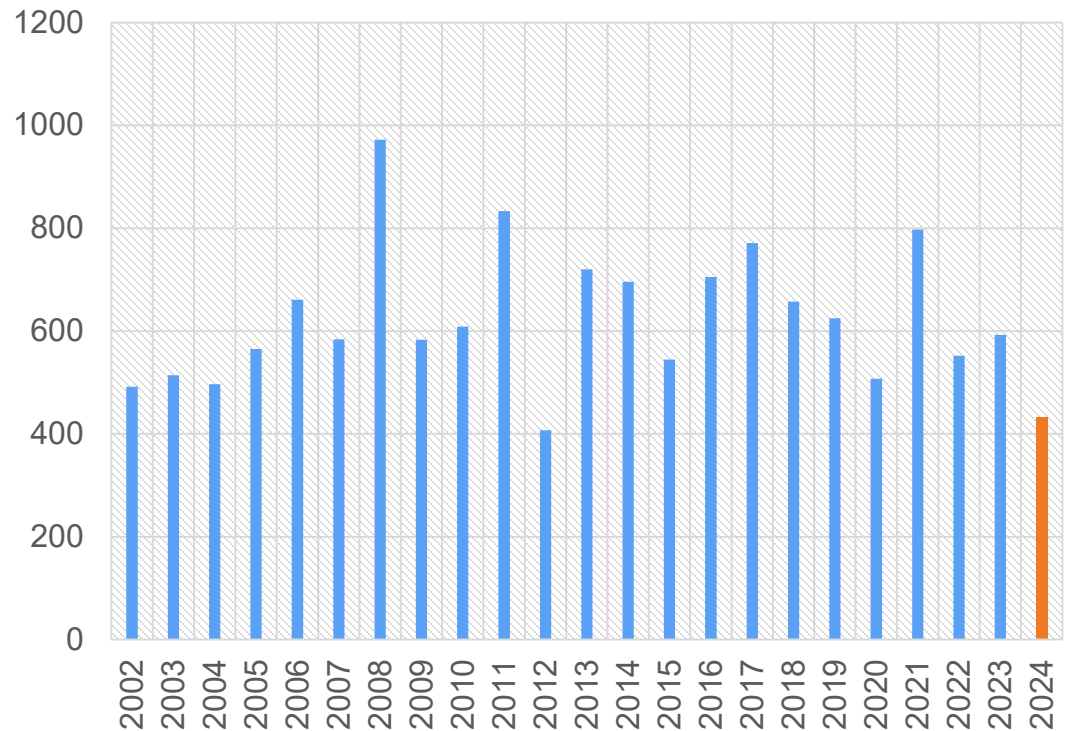
TOWNSHIP OF HURON-
KINLOSS

FEBRUARY 3, 2025



2024 Sampling Year

Annual Precipitation (mm)



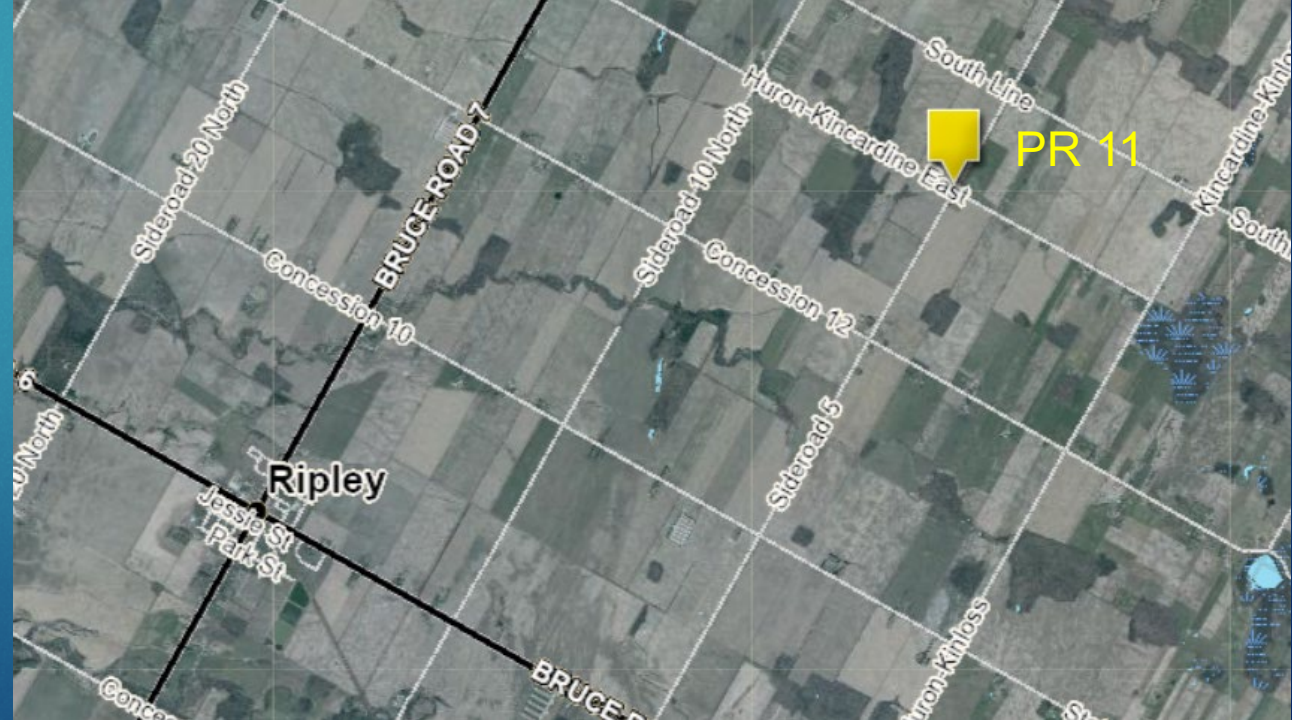
- ▶ Monthly sampling for nitrate, phosphorus and E.coli at sites in the Jardine Creek, Clark Creek, Boyd Creek, Eighteen Mile, Pine River, and Royal Oak watersheds.
- ▶ Sampling captures upstream and downstream sites, as well as Lake sites.
 - ▶ Allows for analysis of spatial trends across the watersheds.
- ▶ 2024 was the second driest year in terms of annual precipitation in last 22 years.

E.coli

- ▶ Provincial Water Quality Objective (PWQO) = 100 cfu/100 mL.
- ▶ Lake sites
 - ▶ Generally, most results were below the 100 cfu/100 mL.
- ▶ In-Stream sites
 - ▶ PR 11 (Royal Oak Creek) consistently has elevated E.coli levels but levels decrease downstream.
 - ▶ Jardine Creek sites – sampling was generally above 100 cfu/100 mL.
 - ▶ In Pine River, most sites were below the PWQO and the trend is levels decline downstream.

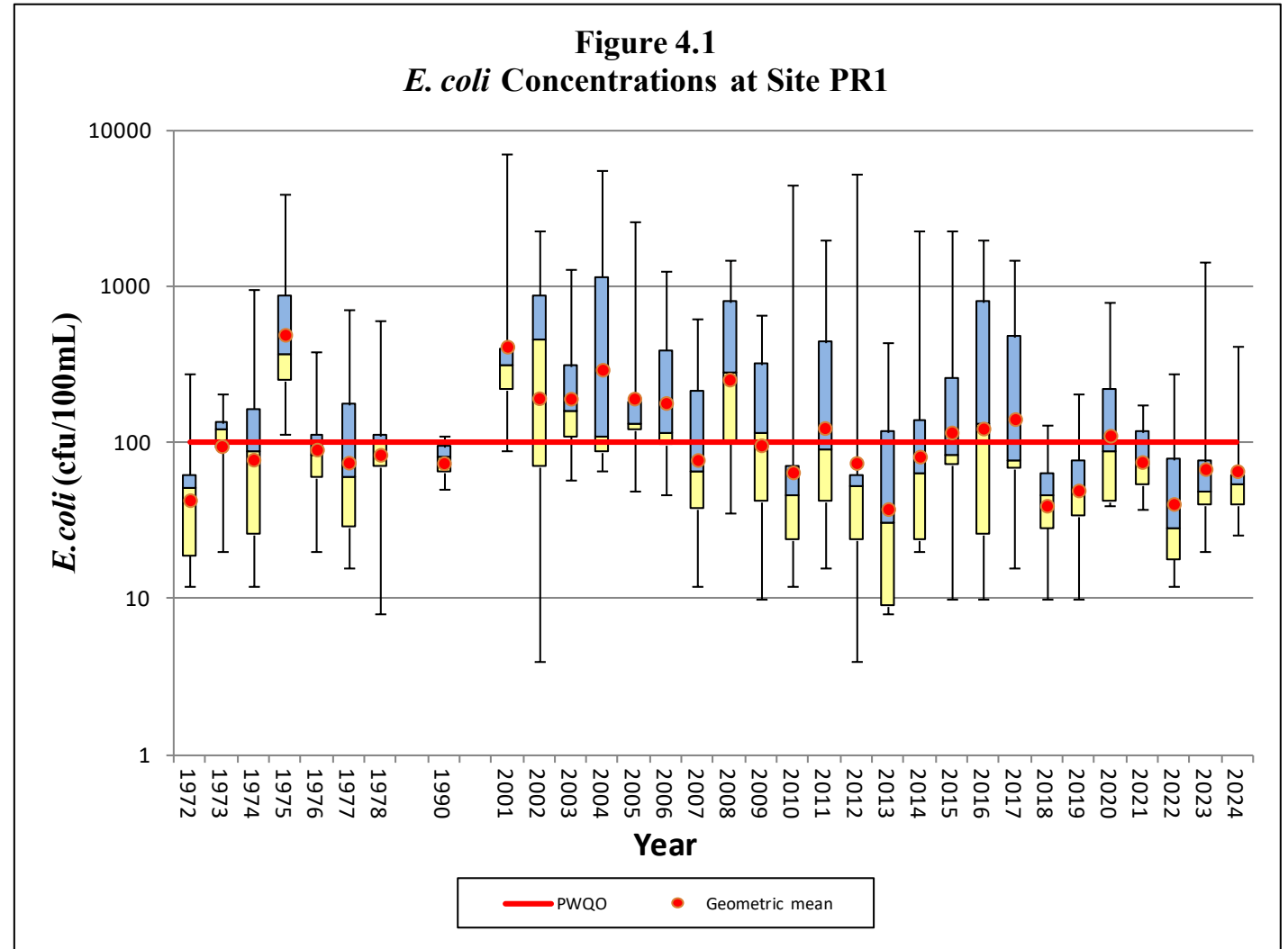


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Historic Trends

- ▶ E.coli levels appear to be continuing to decrease
- ▶ Precipitation amount appear to be a factor in E.coli levels.
- ▶ Likely also more responsive to changes in best management practices, improvements to septics, etc.
- ▶ High levels in Jardine Creek – may be influenced by older septic systems, organic soils (the black muck) in the streambed.
- ▶ PR11 – Royal Oak Creek – likely localized agricultural impacts.

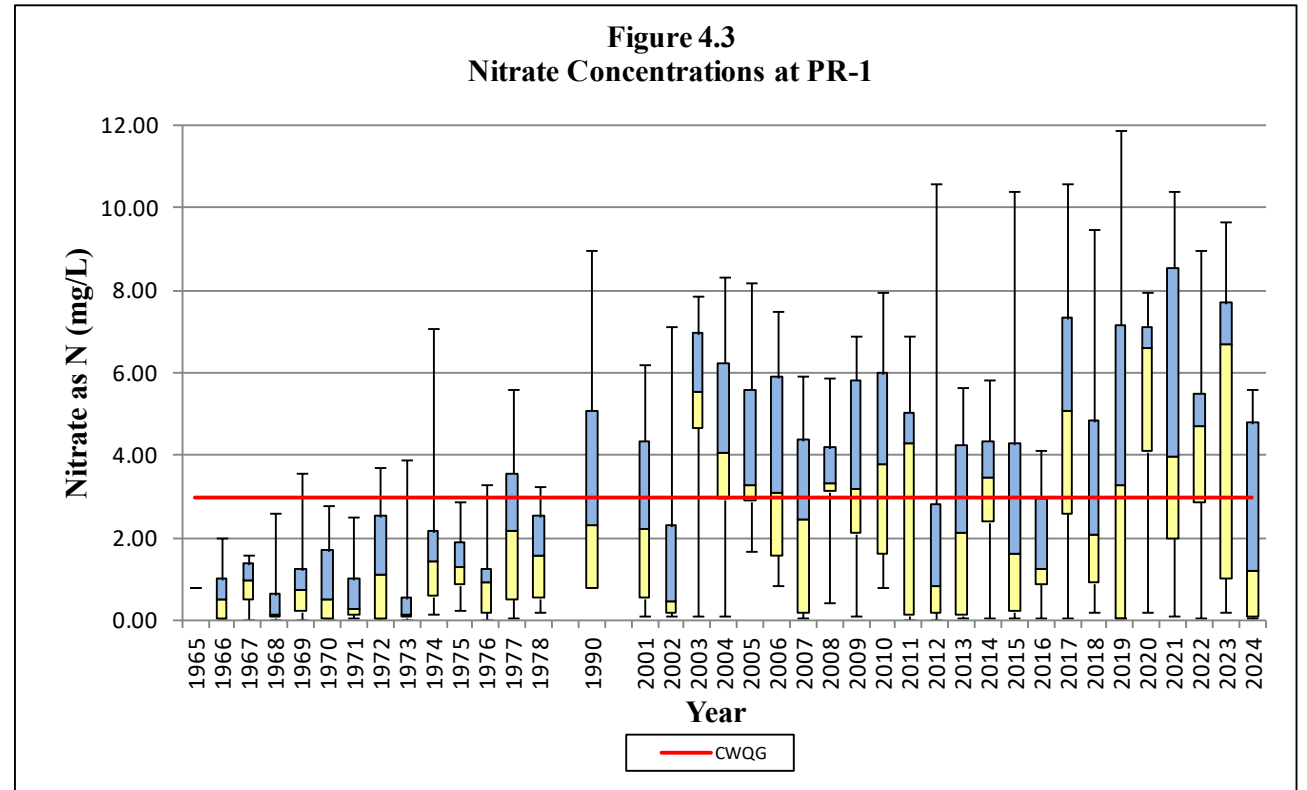


Nitrates

- ▶ Canadian Water Quality Guideline (CWQG) = 3.0 mg/L
- ▶ Lake sites
 - ▶ Only two exceedances of the CWQG
- ▶ Inland sites
 - ▶ August to November there were almost no exceedances.
 - ▶ Site 5 (Point Clark Falls) had consistently high nitrates before July 15
 - ▶ PR11 (Royal Oak) had consistently high nitrates before July 15
 - ▶ Appears there is uptake of nitrates as they move downstream

Historic Trends - Nitrates

- ▶ Studies/models starting to show lagged response to best management practices and nitrate levels in riverine systems.
- ▶ Lag in improvements to nitrate levels can be multi-decade due to legacy nitrates in groundwater, soils and sediments.



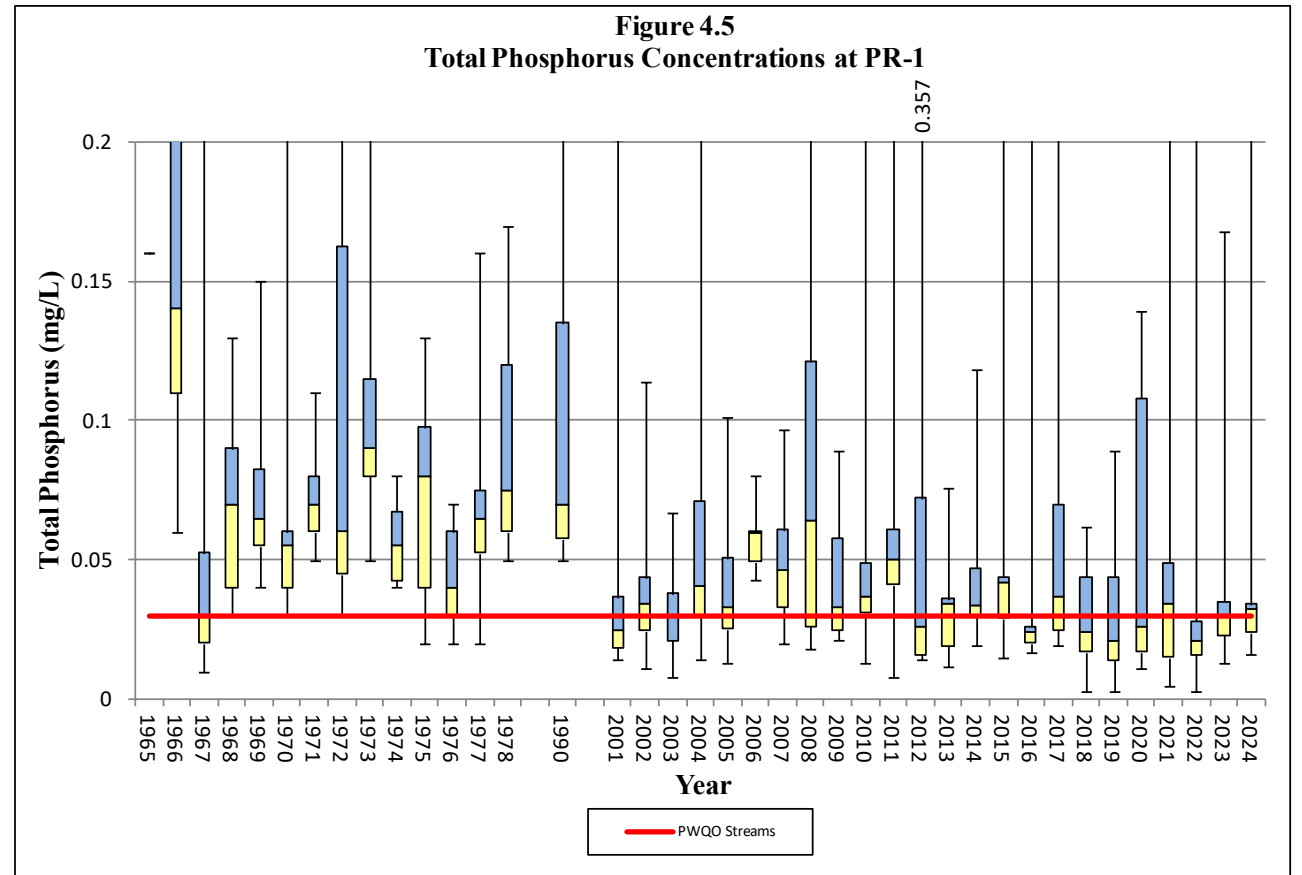
Phosphorus

- ▶ PWQO for lakes = 0.02 mg/L
- ▶ PWQO for rivers/streams = 0.03 mg/L
- ▶ Lake sites
 - ▶ Most results below the PWQO
- ▶ Inland sites
 - ▶ More variability in results
 - ▶ PR11 (Royal Oak) – very high phosphorus results, but saw decreases downstream
 - ▶ PR17 (Pine River) – very high, but saw decreases downstream
 - ▶ Jardine Creek – generally high results in contrast to low nitrates



Historic Trends

- ▶ Continuing to see decline in phosphorus levels, but there is still fair amount of variability.
- ▶ Legacy phosphorus in soils may be a contributor to watershed phosphorus levels.
 - ▶ Built up levels of phosphorus from past inputs (livestock, fertilizer, human activities)
- ▶ Warmer winters resulting in soil thawing earlier and before plants come out of dormancy → more phosphorus run-off.
- ▶ Studies starting to show decreased phosphorus inputs not impacting crop yields over 10-year period.
 - ▶ Likely due to legacy phosphorus



What does this tell us?

- ▶ Low precipitation is a factor for lake water quality
 - ▶ Less nutrients being carried into the lake
- ▶ Generally seeing downstream attenuation of phosphorus, E.coli and nitrates
 - ▶ Improvements to best management practices
- ▶ New models and studies on legacy nutrient levels are matching what we are seeing in the field.
 - ▶ Importance of patience in looking for change
- ▶ Program allows us to monitor long-term trends, identify issues/changes along the lengths of the watercourses.

Questions?