

Gradient-Based Assessment of Ecosystem Resilience

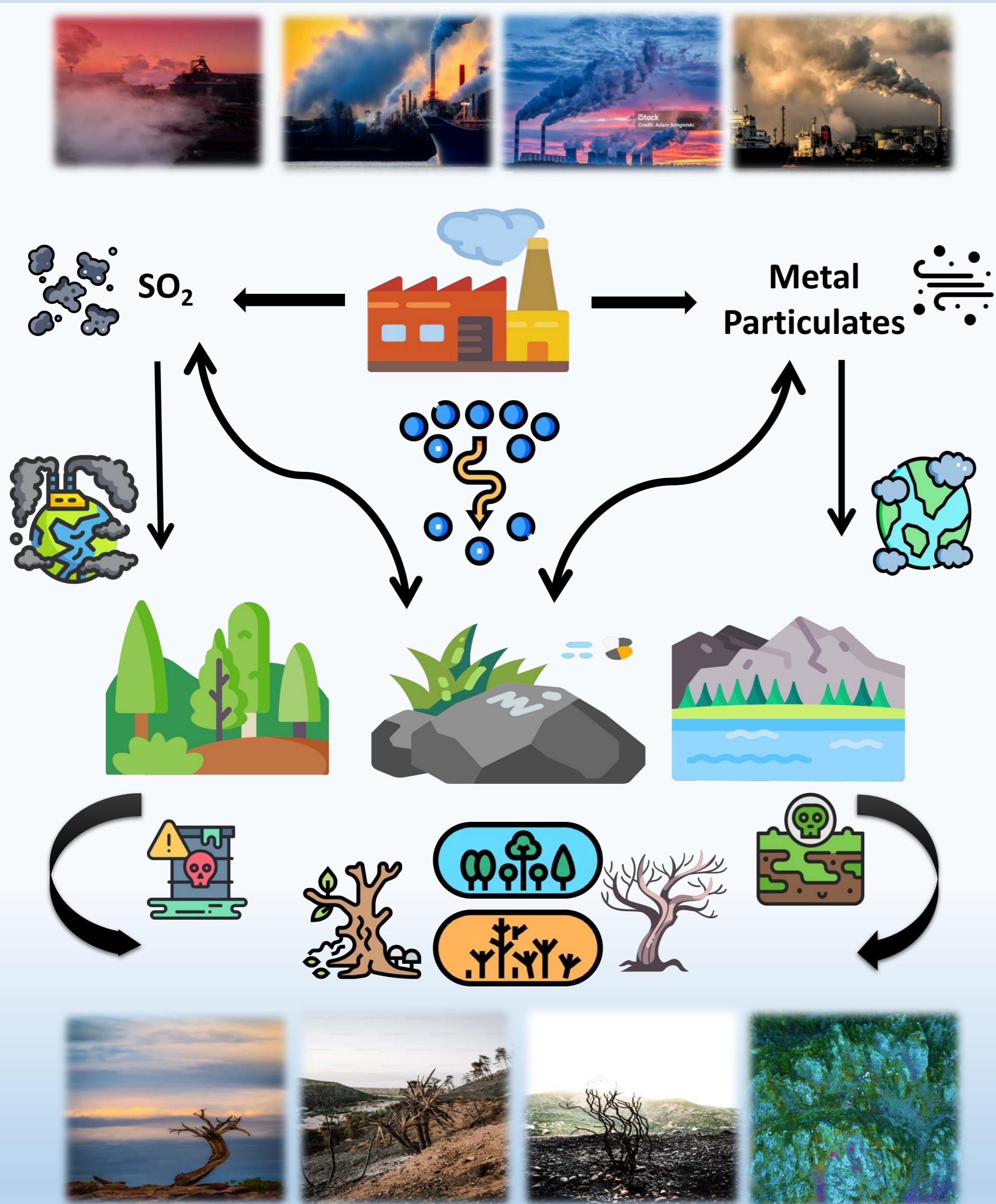
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(A) Context

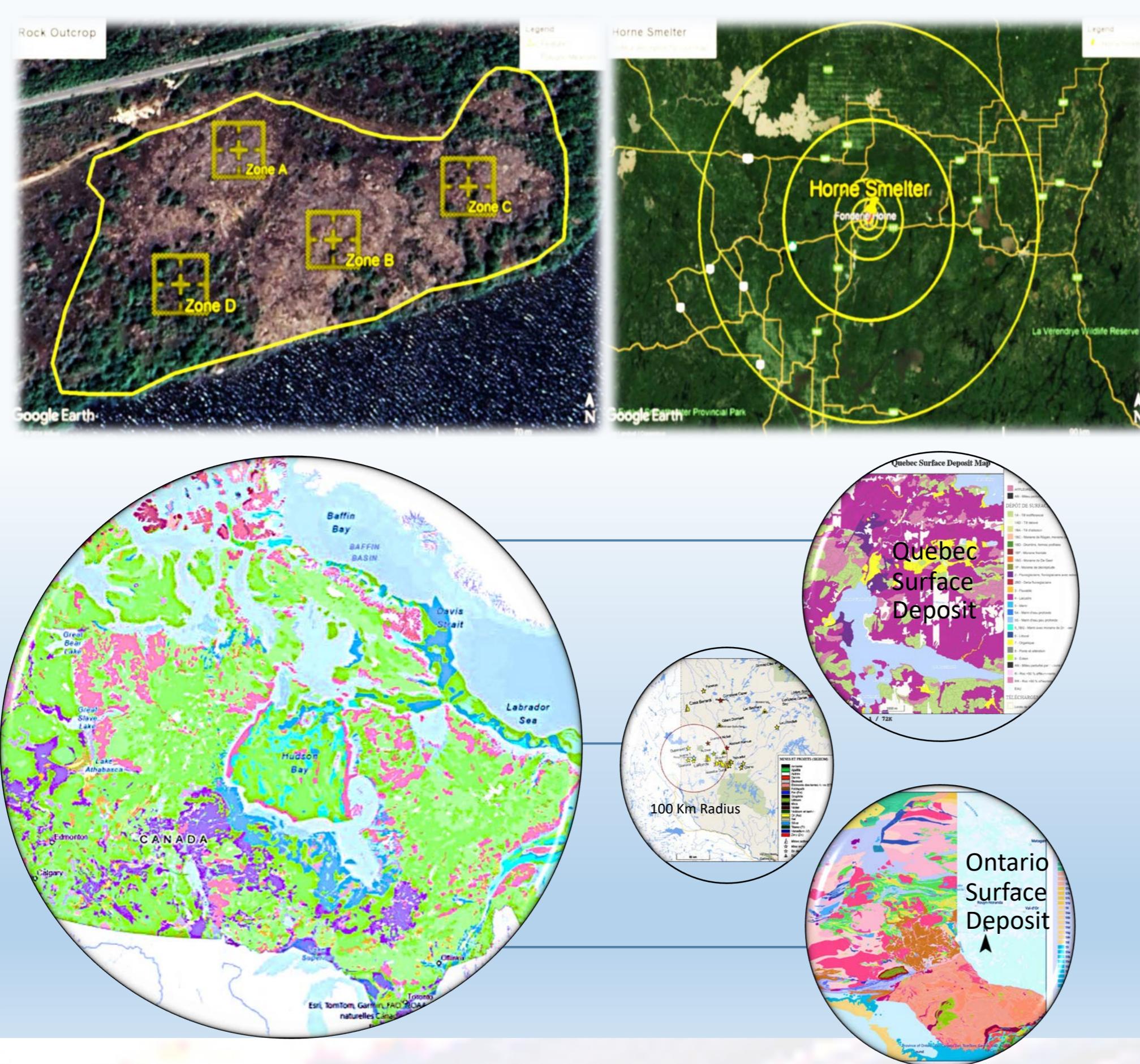
SO₂ gas and metal emissions caused soil acidification and metal toxicity.

Impacted the surrounding ecosystem.



(C) Study Area

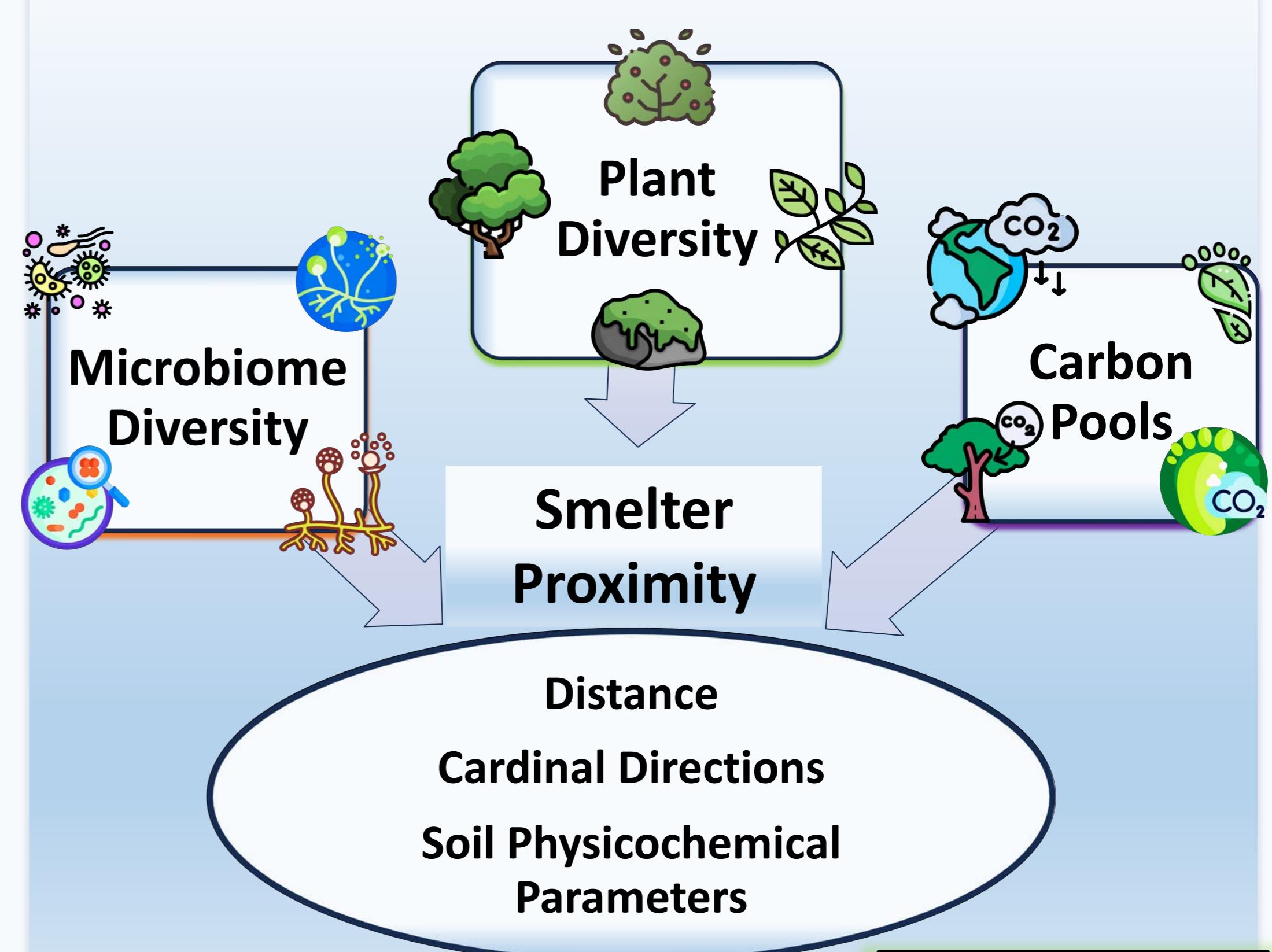
Rock outcrops will be sampled within a **100 km radius** of Horne Smelter.



(E) Possible Outcome

This study will shed light on the effects of the Horne Smelter on surrounding rock outcrops, including changes in vegetation, microbial diversity, and carbon dynamics.

(B) Objectives



Hypothesis

- | | | |
|---|---------------------------------|--|
| 1 | Distance + Plant Diversity + | Soil Metal Content + White Birch + <i>Ceratodon purpureus</i> + |
| 2 | Distance + Microbes Diversity + | Soil pH + Soil Metal Content + Microbes Abundance and Richness - |
| 3 | Distance - Carbon - | Carbon ⇌ Bulk Density
Soil pH
Soil Metal Content |

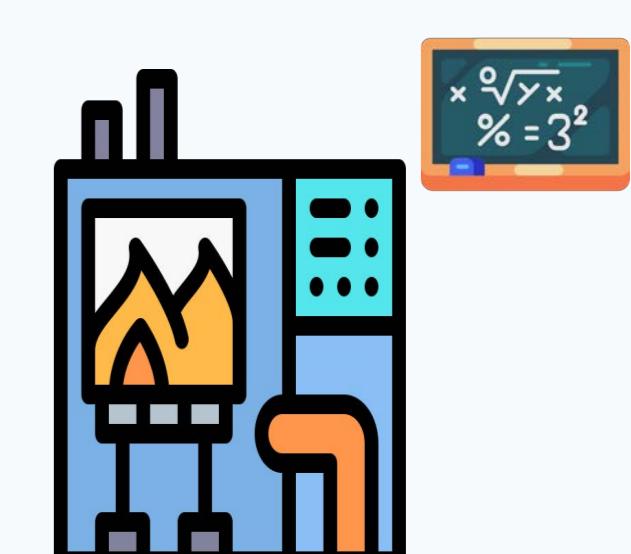
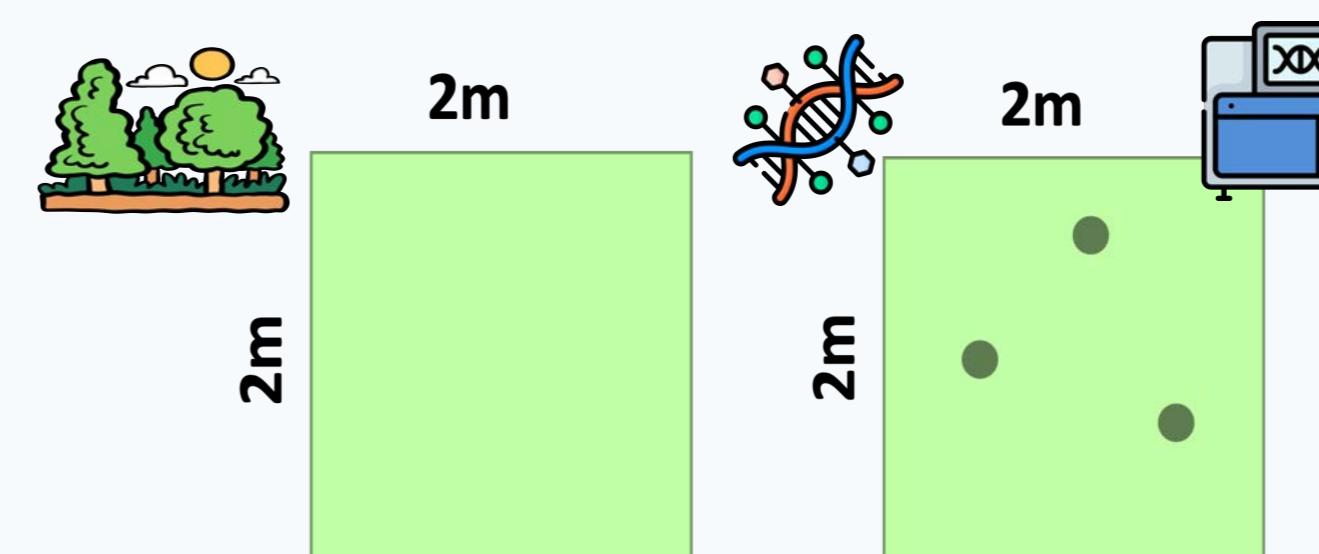
(D) Methods



Vegetation Sampling
2m×2m plot
Abundance
presence/absence

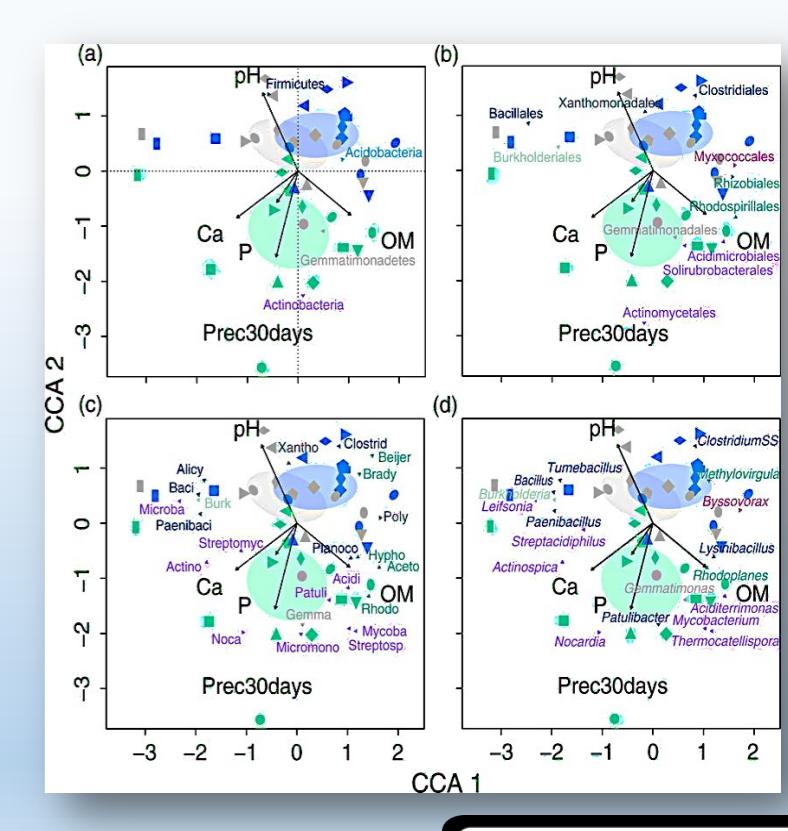
Soil Sampling
DNA Metabarcoding
Physicochemical Parameters

Carbon Measurement
Above-ground
Below-ground
Organic Soil



Data Analysis

Mixed models
Ordination
Techniques



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