

2004 Ecological Risk Assessment (ERA) Sampling Program

Why did we need to conduct the 2004 Field Program?

Currently, the effect of metals in Sudbury soils on local plants, invertebrates, and microbes is not well understood. There are specific conditions that make the Sudbury region different from many other areas, including:

- a number of different metals exist in the soil, and
- the soil has a higher than average acidity (low pH)

Given these specific conditions, it is better to have data that was collected from natural areas around Sudbury rather than relying on information available from other regions, which may not be appropriate.

The main question that the 2004 Field Study aimed to answer was:

Do soil metal levels in Sudbury's natural areas present an unacceptable risk to forest ecosystems?

This question will be answered by combining results from 4 studies:

1. Toxicity testing
2. Litter bag studies
3. Soil sampling
4. Ecological characterization

The results from these studies will be combined in the ERA to produce an assessment of risk from soil metal levels.

Where did we conduct the 2004 Field Program?

A total of 22 sites were established during the summer of 2004 (see map). We set up three lines; one radiating out from each of the smelters (Copper Cliff, Coniston and Falconbridge). Metal levels are higher closer to the smelters, and levels get lower as you move further away. Sites were selected along these lines. We also set up a reference site at the end of each line that represents an area with soil metal levels typically found throughout Ontario.

Toxicity Testing

Determines the effects of metals in soils on local plants and invertebrates. These tests are performed in a laboratory and involve growing plants and breeding invertebrates in soils collected from the Sudbury area. These plants and invertebrates are grown in soils with a range of metal levels – this allows us to compare growth, survival, reproduction and behaviour between areas with different metal levels.

Litter Bag Studies

Decomposition, or breakdown of organic material by soil microbes, is a good sign of a healthy ecosystem. To examine effects from soil metals on soil microbes, we take measurements to determine if organic matter at the site (such as leaves and branches) decomposes.

Soil Sampling

We took soil samples (cores) at each site, which were then sent to the laboratory and analyzed. Characteristics of these soils will allow the SARA Group to compare between sites and understand how the metals are behaving in the soil.

Ecological Characterization

We examined the vegetation communities (types and number of plants and trees) at each of our sites. This allows us to compare the laboratory toxicity tests and soil characteristics to the actual plant communities found at each site.

