GEOSCIENCE IN ENVIRONMENT AND HEALTH PROTECTION

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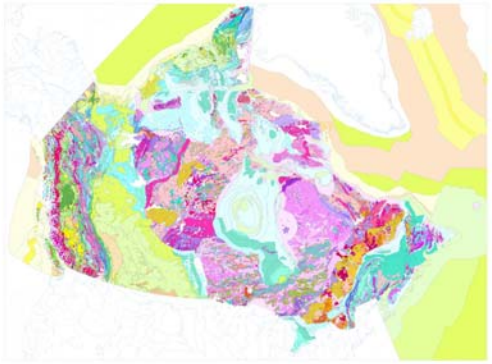
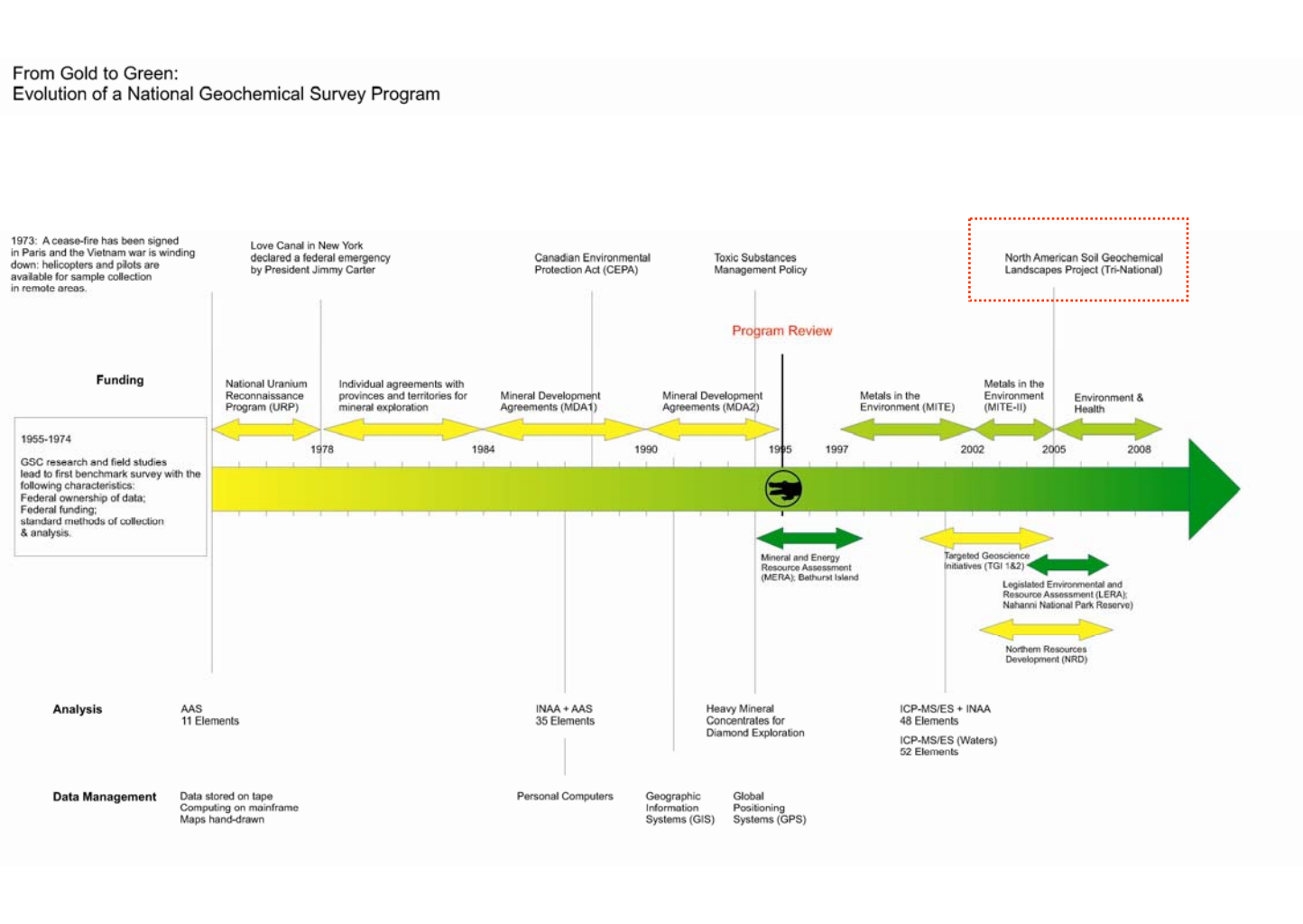


Geoscience in Environment and Health Protection

- *Four priority areas for the Earth Science Sector*
  - *Earth sciences as they relate to:*
    1) Economic opportunities
    2) Clean environment
    3) Enhancing resilience in a changing climate
    4) Public safety and security

Environmental Geochemistry in Environment and Health Protection



Geoscience in Environment and Health Protection

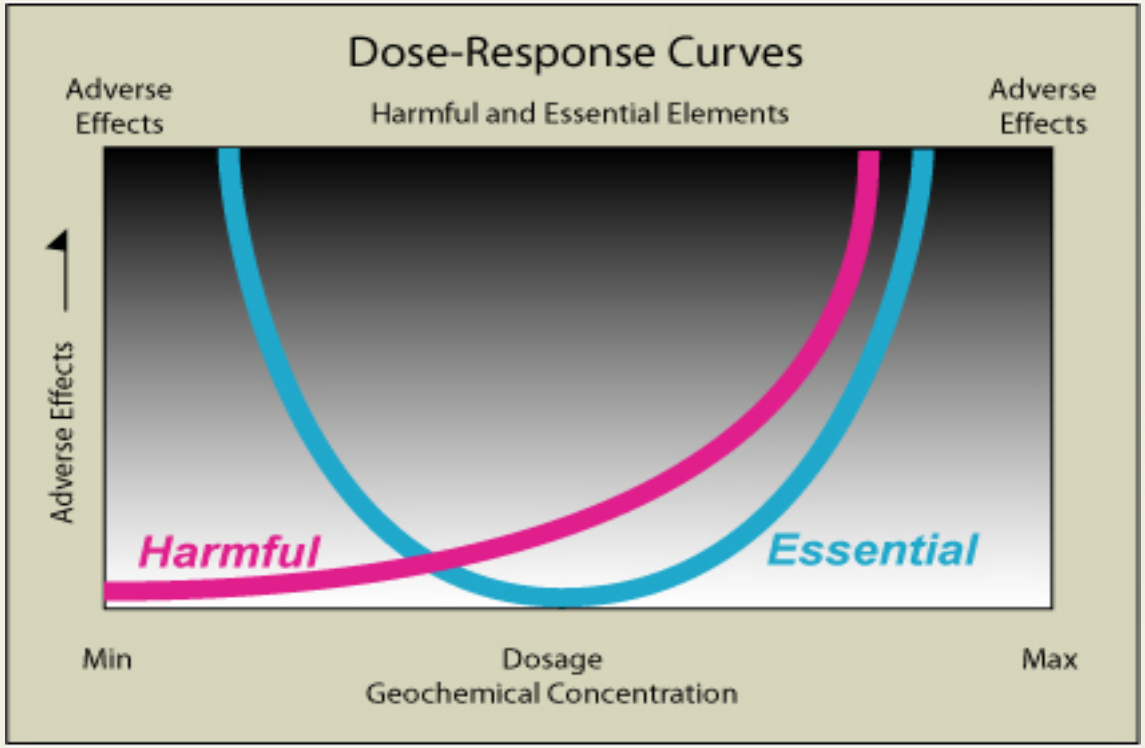
Geoscience contributes the following:

- *Foundation (Data)*
  - *Stable, predictive environmental framework*
  - *Sampling and analytical protocols*
  - *Natural variability - mineralogy, process*
- *Interpretive Tools*
  - *Soil properties and transfer capacities*
- *Environmental Models*
  - *Predictive risk models*

Geoscience in Environment and Health Protection

Why is there a role for geochemistry?

Most elements are required to sustain life, but excessive doses or insufficient amounts of the same element may be harmful.

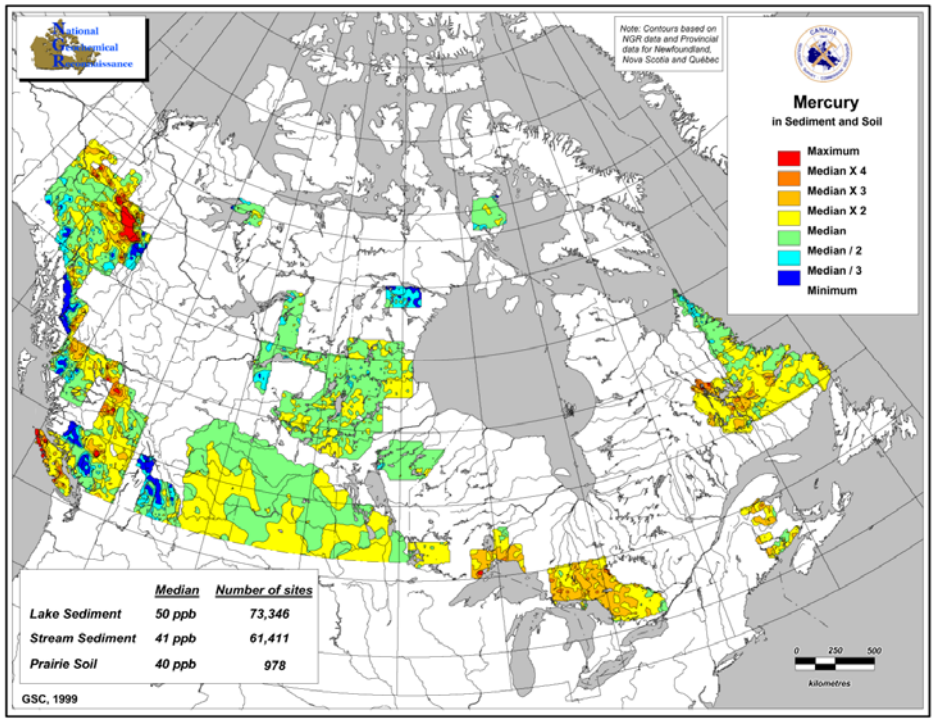


Arsenicosis

Geoscience in Environment and Health Protection

What is the role for geochemistry?

- Geographic areas with health risk potential can be identified through application of geoscience knowledge.



HG IN SOILS AND SEDIMENTS

Areas with high levels of naturally-occurring Hg (high risk potential)

Areas with low levels of naturally-occurring Hg (low risk potential).

Plot based on Geological Survey of Canada geochemical data for lake sediments, stream sediments and soils from National Geochemical Reconnaisance Program surveys.

Geoscience in Environment and Health Protection

- Geoscience information is crucial for making informed decisions about potential risks to the environment and human health
- Geochemistry relates directly to contaminant concentration and supports assessment of bioaccessibility.

Contaminant Concentration x **Exposure Factors** x **Bioaccessibility**

Body Weight

High risk of arsenic exposure led to the closure of a clam fishing site in Nova Scotia.

Partnerships will be required to deliver on the objective of ensuring a clean and healthy environment.

Good luck!