North American Soil Geochemical Landscapes Project

Application of Provincial Geochemical Databases: A Nova Scotia Perspective

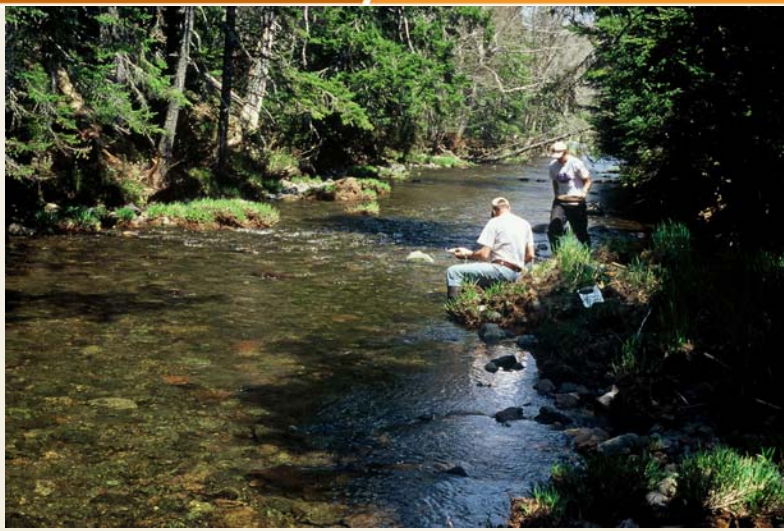
Presenter: **Terry A. Goodwin (Project Geochemist)**

Organization: **Nova Scotia Department of Natural Resources**

NOVA SCOTIA
Natural Resources

Canada

Organization and Mandate



- **<u>Structure:</u>**

Mapping and Geochemistry Division

Mineral Resources Branch

Nova Scotia Department of Natural Resources

- **<u>Mandate:</u>**

(i) Provide geochemical mapping services

(ii) Undertake specialized geochemical research projects

(iii) Provide geochemical data/expertise for a variety of applications:

(1) Mineral (and energy) exploration/development

(2) Environmental protection

(3) Land use planning

Data Requirements

- **<u>Organizational data needs:</u>**

(i) Quality datasets (all stages, consistency)

(ii) Ubiquitous coverage

(iii) Media (soil)

(iv) Metadata

(v) Archive

… quality data accessible/used by wide variety of clients!!!

- **<u>Specific to the North American Soil Geochemical Landscapes Project:</u>**

(i) Guidelines (CCME)

(ii) Defensible (statistically valid)

(iii) Communicate (applicability of the data)

Data Use

How are (bio)geochemical data presently used by your organization?

- **<u>HISTORICAL:</u>**

(1) Mineral Exploration

- **<u>CURRENT:</u>**

(1) Mineral Exploration
(2) Environmental (government, consultants)

- **<u>FUTURE:</u>**

??????????

Arsenic in Drinking Water Risk Map
Human Health Risk study (MITE)
(Prospecting for Fish Using Geology)

Data Application

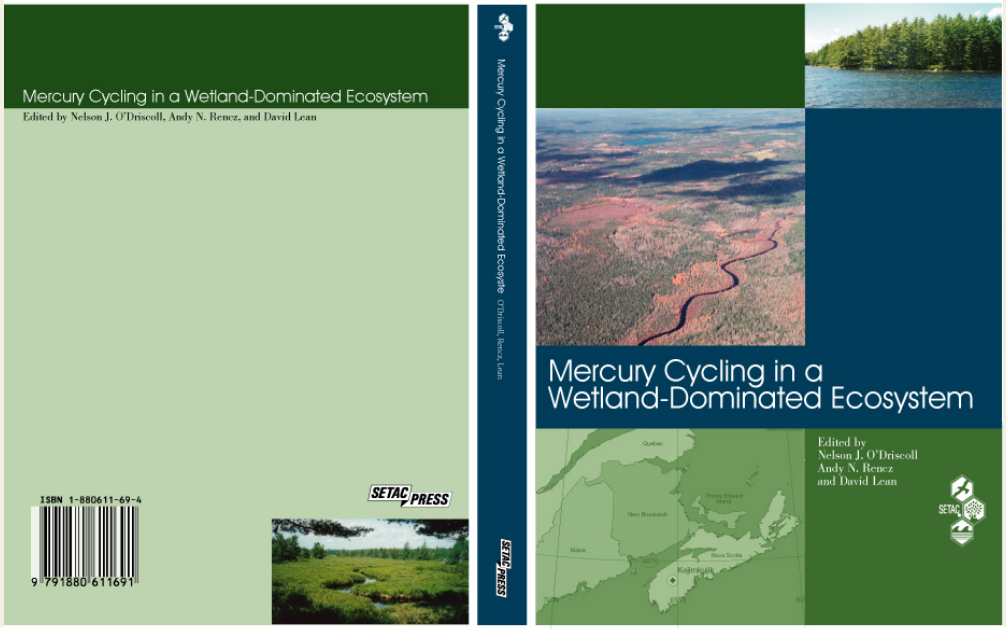
How could the Project data be used to support policy development or regulations?

- **Wide range elements/compounds**
- **Background "regional" concentrations (natural, anthropogenic - loading)**
- **Risk Assessments (human, ecological)**
- **Must conform to (current) legislative requirements (Council of Canadian Ministers of the Environment guidelines)**

New Opportunities

Do the Project data open the door to new opportunities?

- **Inter-government and intra-government**
- **Research partnerships (form, fate, mineralization)**



New Opportunities

Could you use the Project data differently if supported with additional earth science information?

Comments and Insights

Any additional comments?

- **Lacking**
- **Timely**
- **Relevant to the (human/ecological) health of Nova Scotia**

Comments and Insights

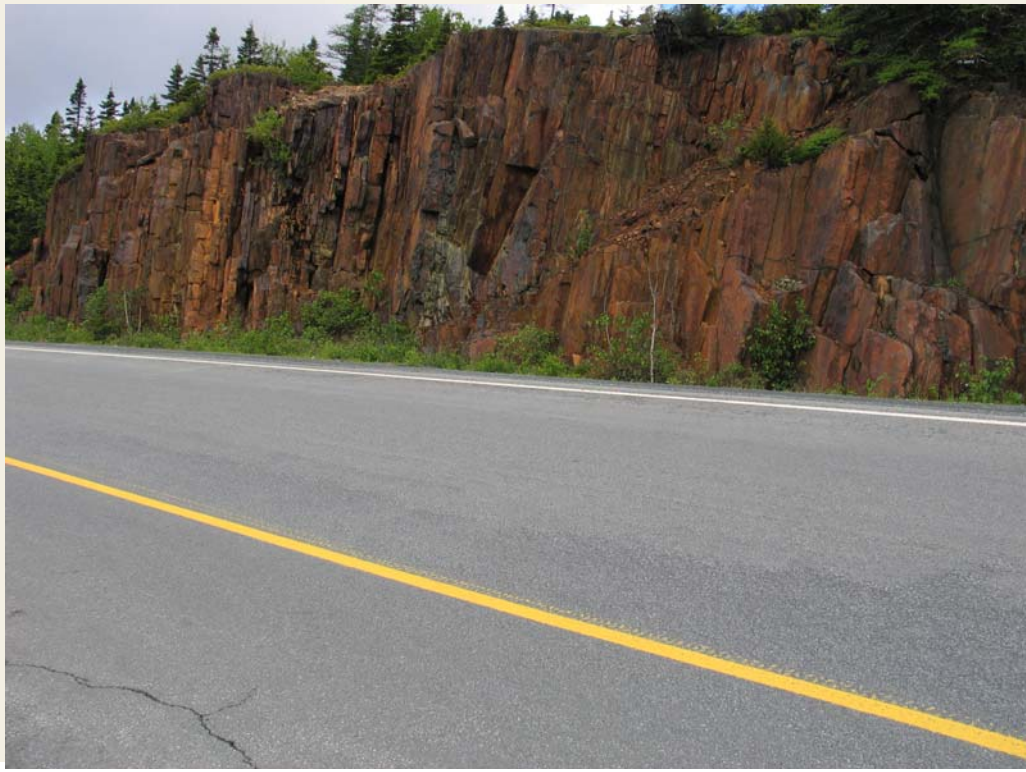
Considerations

- **Define “soil” (horizons)**
- **Consistency (within project – QA/QC, regulations)**
- **End users (government, consultants)**

Comments and Insights

Other Considerations

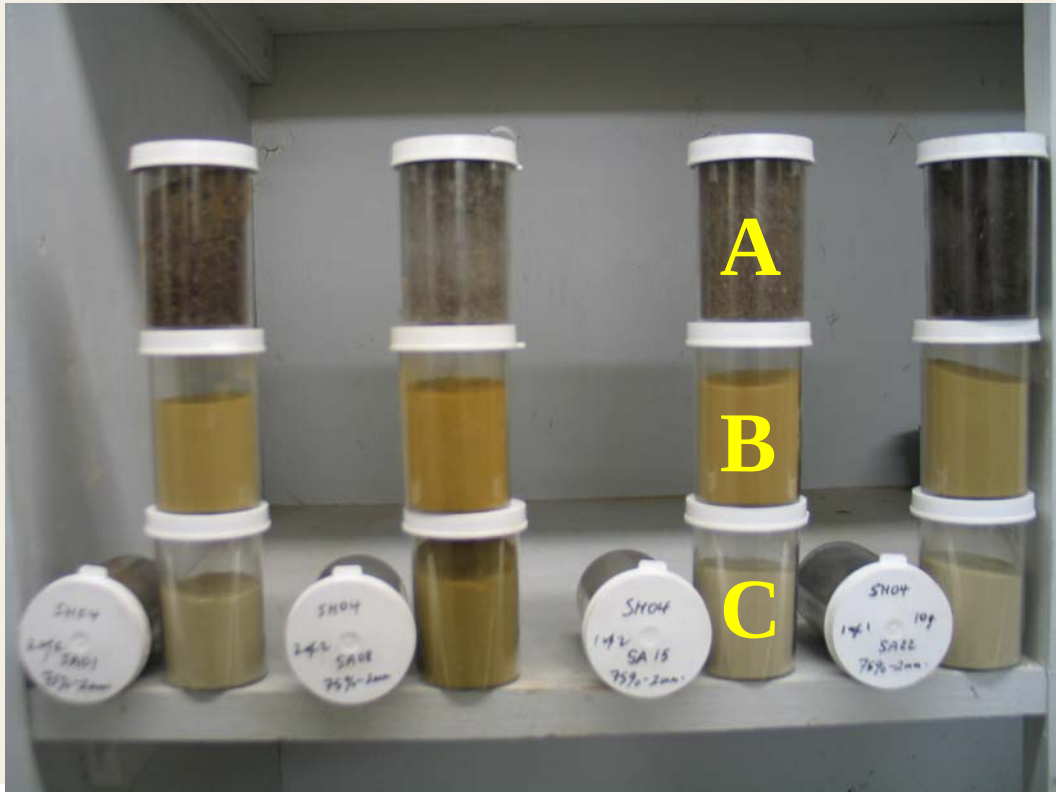
- **Mineralization**
- **Various (glacial) till units (or surficial units)**
- **Gas (radon, mercury etc.)**
- **Acid Base Accounting**
- **Texture**
- **Mineralogy**
- **Digestion**
- **Size Fractions**
- **Loss on Ignition**



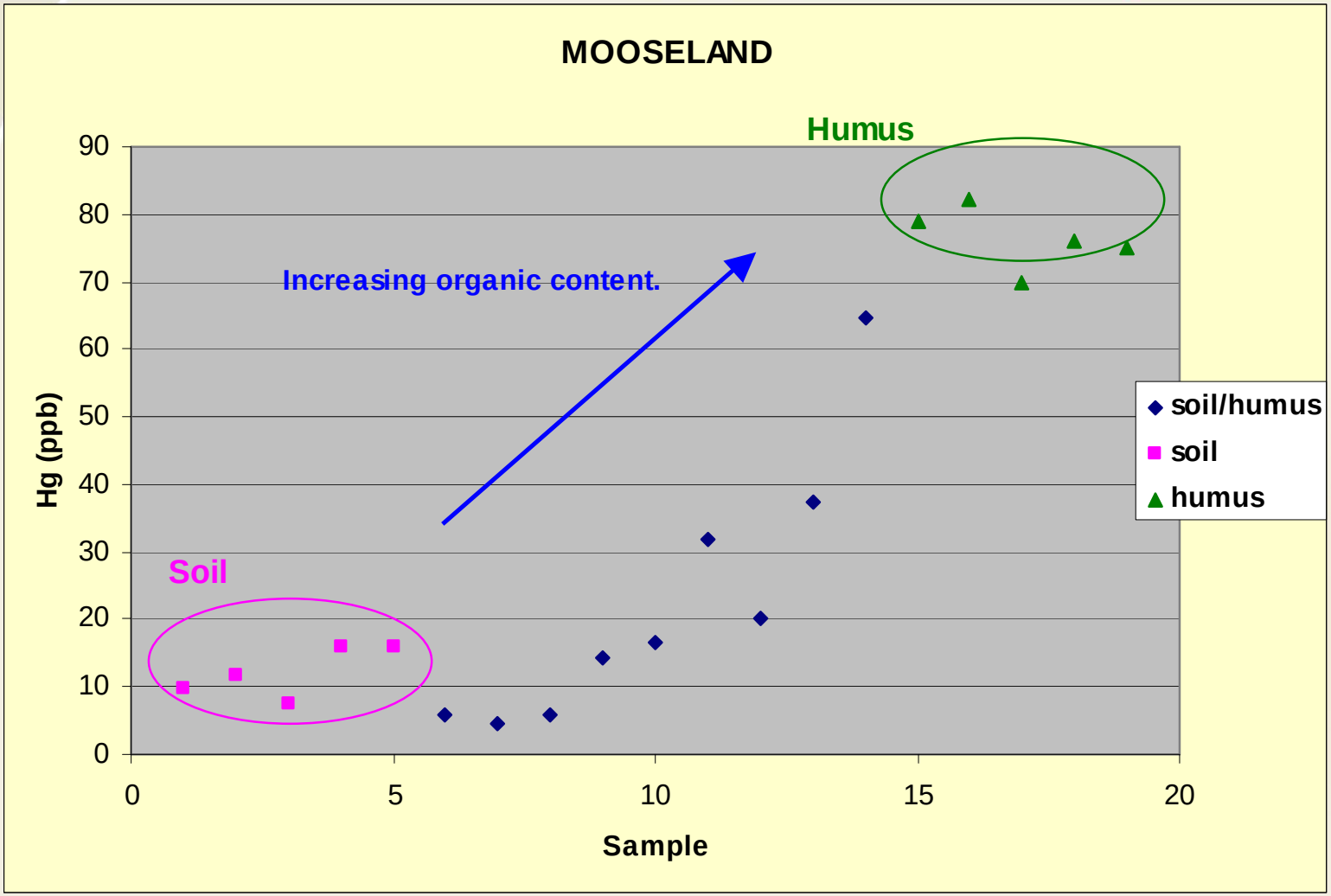
Comments and Insights

Other Considerations

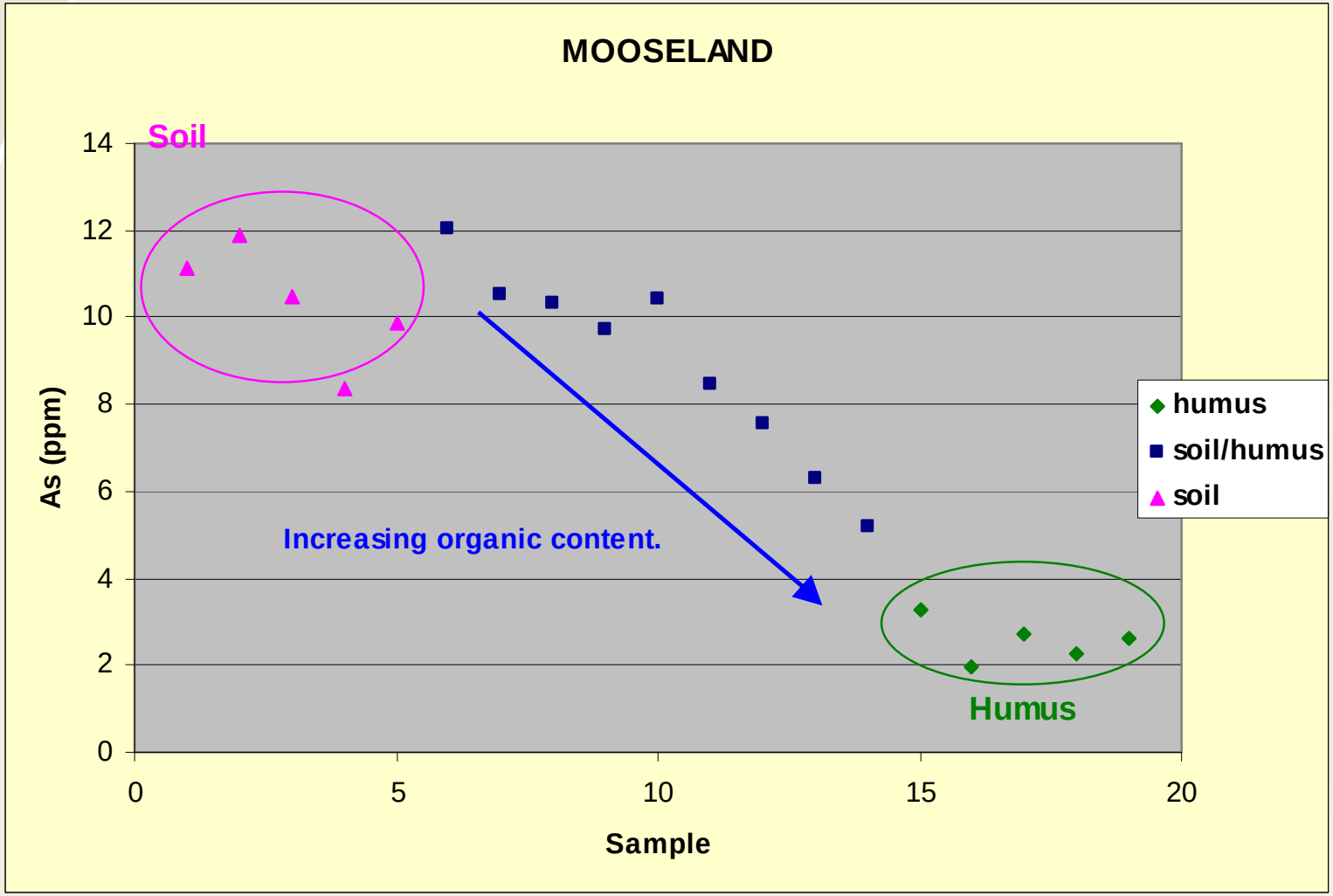
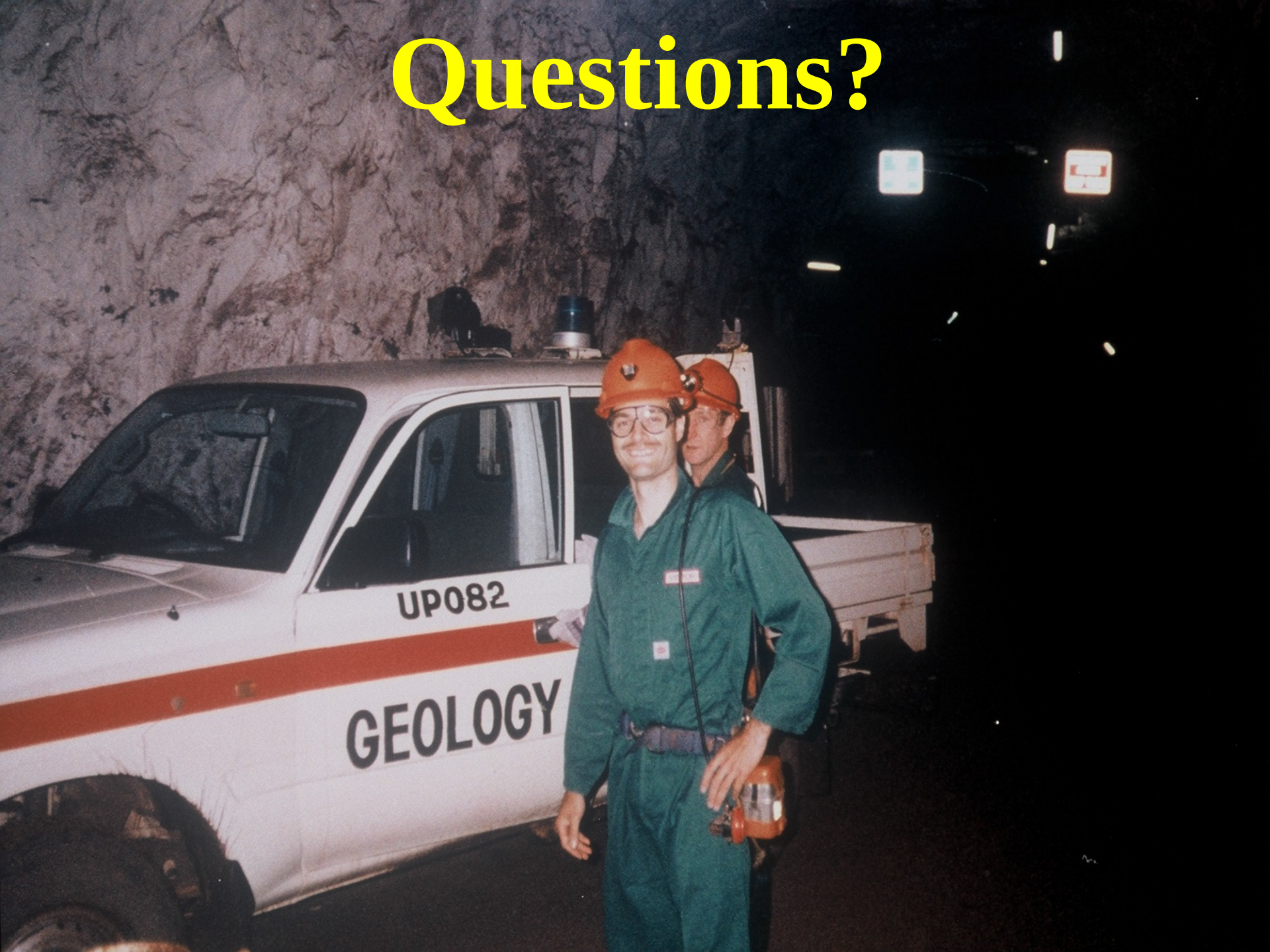
- **Depth sampling vs. medium sampling**
- **Why 0 - 5cm interval? (Why not 0 - 7cm or 3 - 6cm?)**
- **Organics**



Comments and Insights



Comments and Insights



Questions?