BC SOILS DATA and INDICATORS

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Outline

- INTRO
- Available Soils Data
  - Point data
  - Polygon data
- Mapping soil characteristics
- Discussing data needs for soil indicators and cumulative effects analysis

Objective

- To give an overview of provincial soils data holdings

- To facilitate a discussion on data needs for soils indicators and cumulative effects

BC SOILS POINT DATA
BCSIS
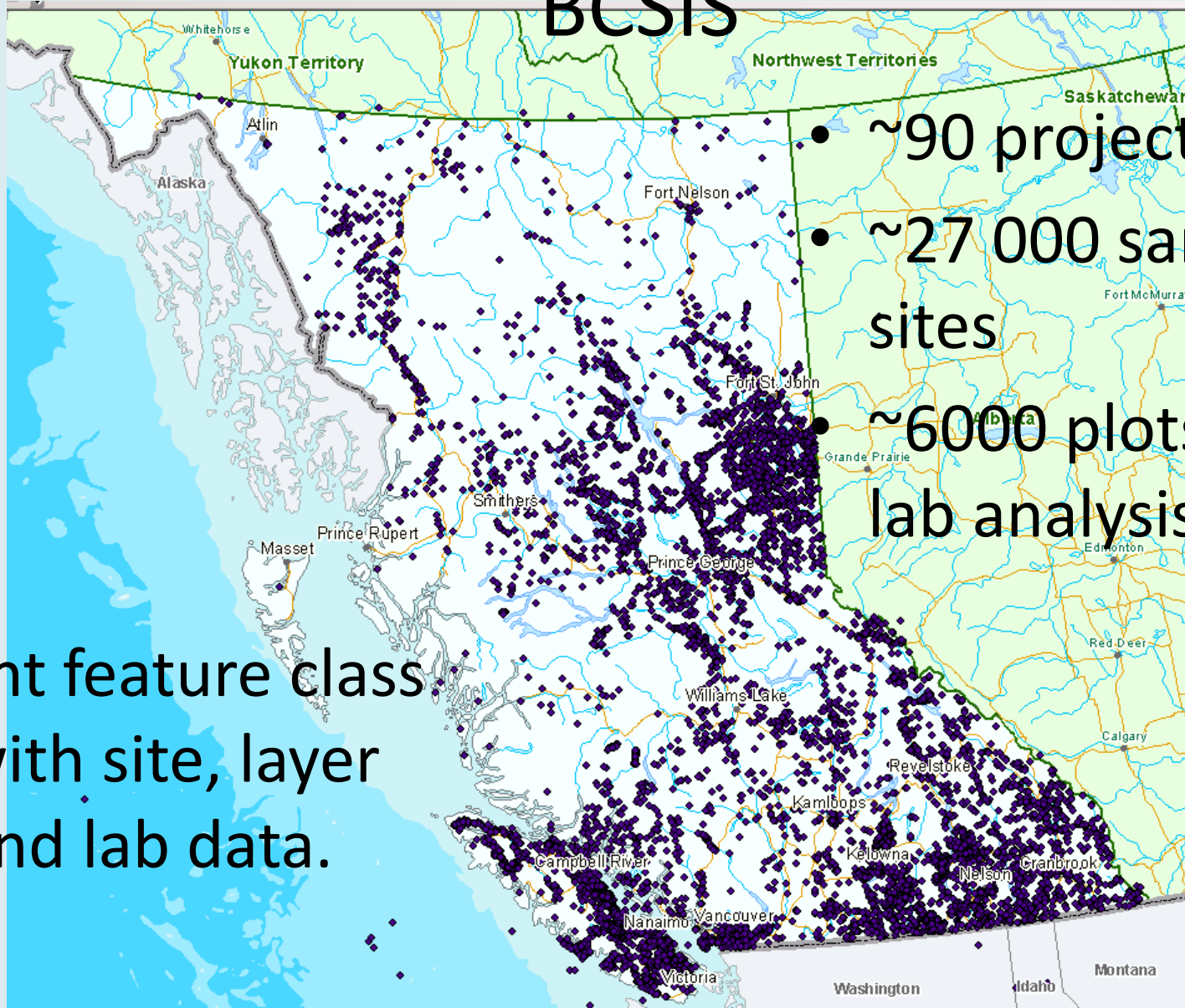
- ~90 projects
- ~27 000 sample sites
- ~6000 plots with lab analysis

Point feature class with site, layer and lab data.

Examples of Site Attributes

- Rooting zone particle size

- Surface stoniness

- Aspect

- Elevation

- Meso-slope position

Examples of Pedon Attributes

- Horizon depth

- Texture (field)

- Colour

- Structure

- pH (field)

Examples of Lab Attributes

- pH

- Texture: % sand silt and clay

- Total C and N

- CEC

- Extractable elements

	Mehlich 3 Extractable Elements												E.C.	pH	Total C and N		Soil Texture		
Sample	**Al**	**B**	**Ca**	**Cu**	**Fe**	**K**	**Mg**	**Mn**	**Na**	**P**	**S**	**Zn**	**Cond.**	**(H2O)**	**C**	**N**	**Sand**	**Silt**	**Clay**
	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mS/cm	pH	%	%	%	%	%
1(Ahs1)	80	5.34	10629	5.87	176	1051	2265	125	8132	118.6	8666	9.05	22.3	7.96	8.57	0.730	19.4	63.4	17.2
2(Ahs2)	4.19	0.33	5409	5.63	170	128	1004	58.6	940	5.44	659	1.63	5.86	8.41	2.67	0.168	9.5	75.2	15.3
4(Bg1)	289	< 0.01	1733	4.38	459	33.1	314	54.5	264	2.19	229	0.63	2.65	8.32	0.42	0.031	10.5	84.4	5.0
5(Bg2)	293	< 0.01	758	3.26	421	28.9	201	59.8	134	0.85	93.1	0.68	1.69	7.48	0.24	0.020	67.3	30.2	2.5
6(Cg)	20.6	0.44	4571	0.97	837	150	569	112	378	9.10	353	0.69	3.80	8.06	1.38	0.112	19.0	72.2	8.9

Other Centralized Repositories?

- Biogeoclimatic Ecosystem Classification plots
- Ecosystem Mapping plots
- National Pedon Database
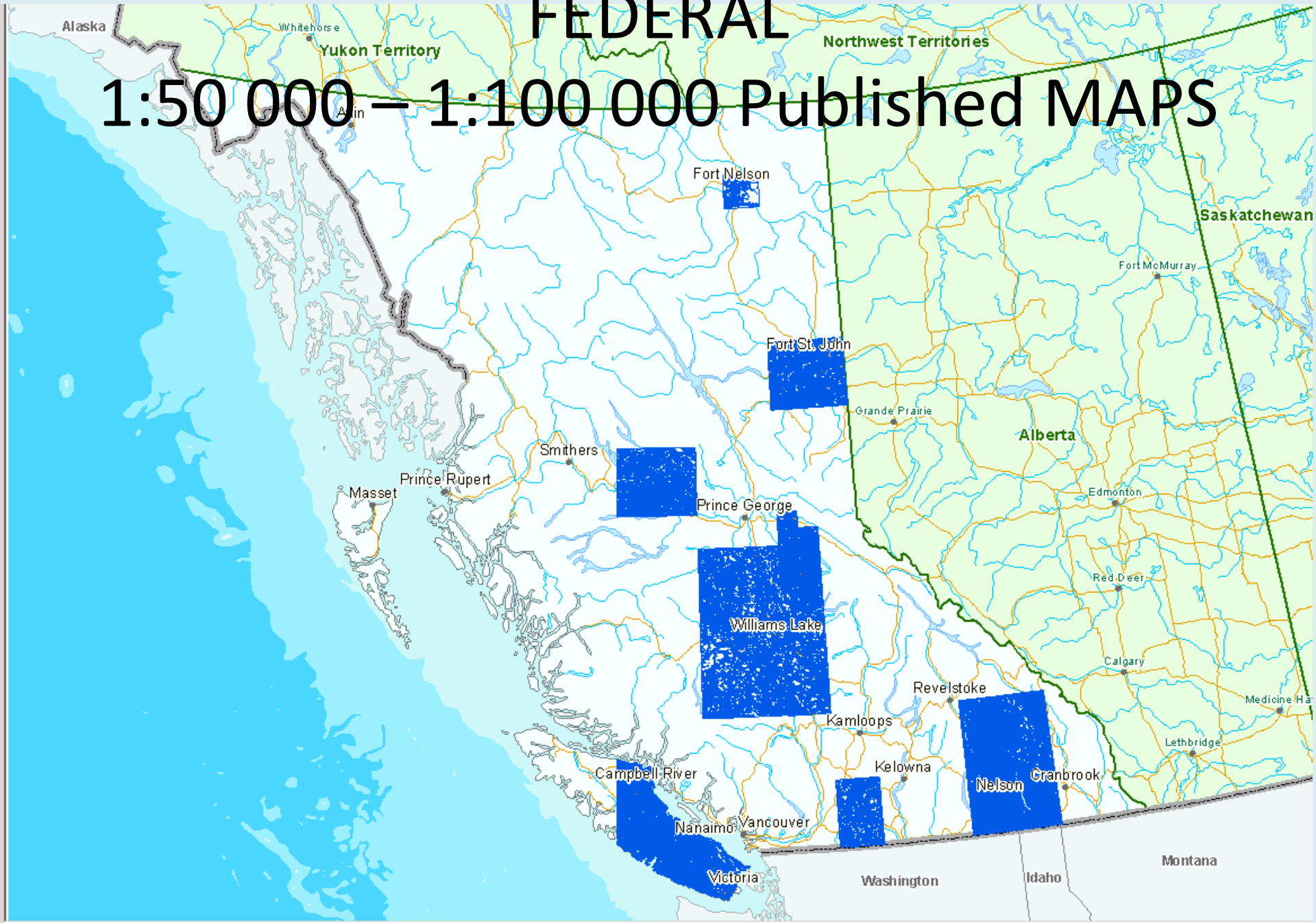- UBC soils inventory samples
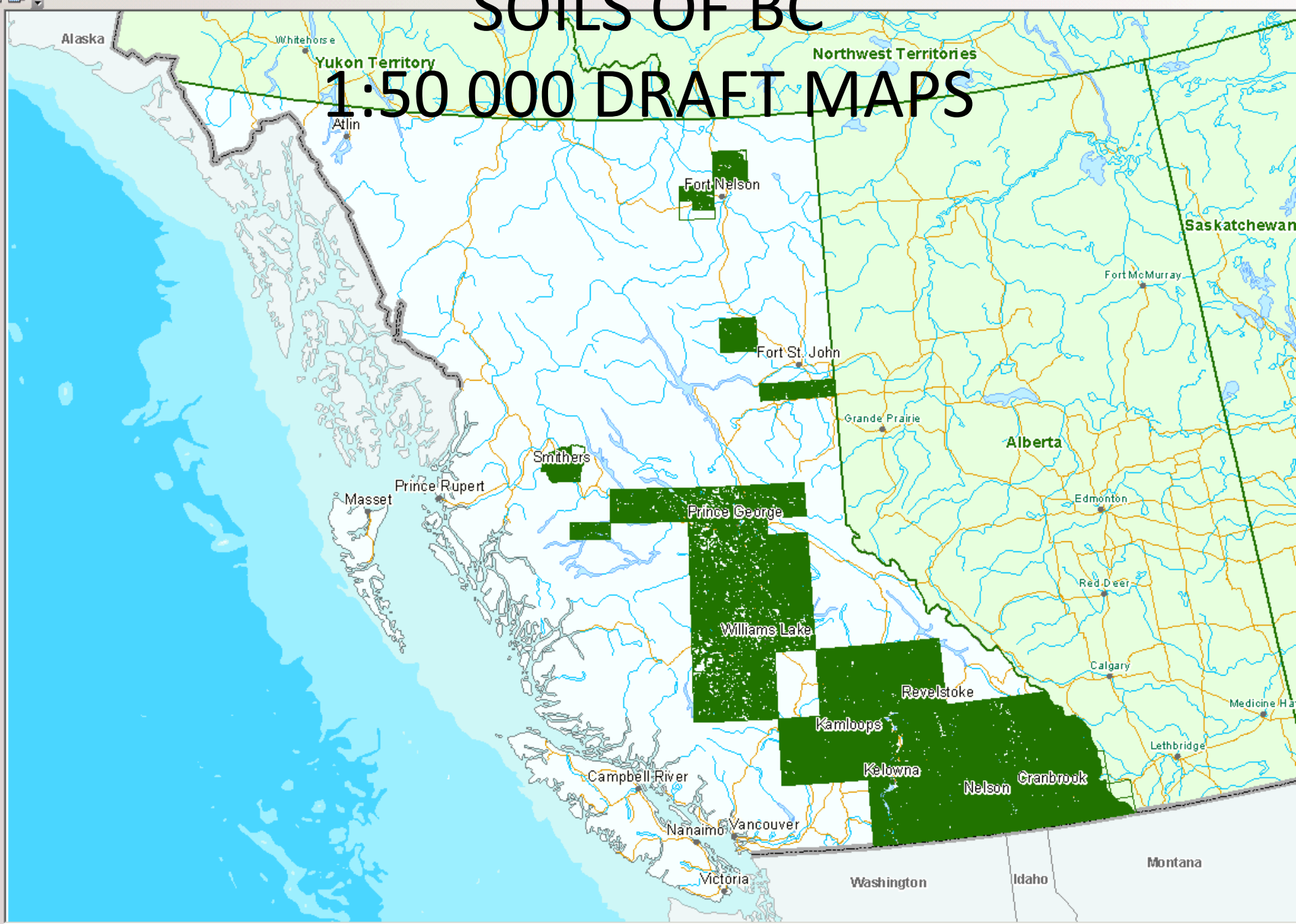
SOIL LANDSCAPES OF CANADA
1:1 000 000
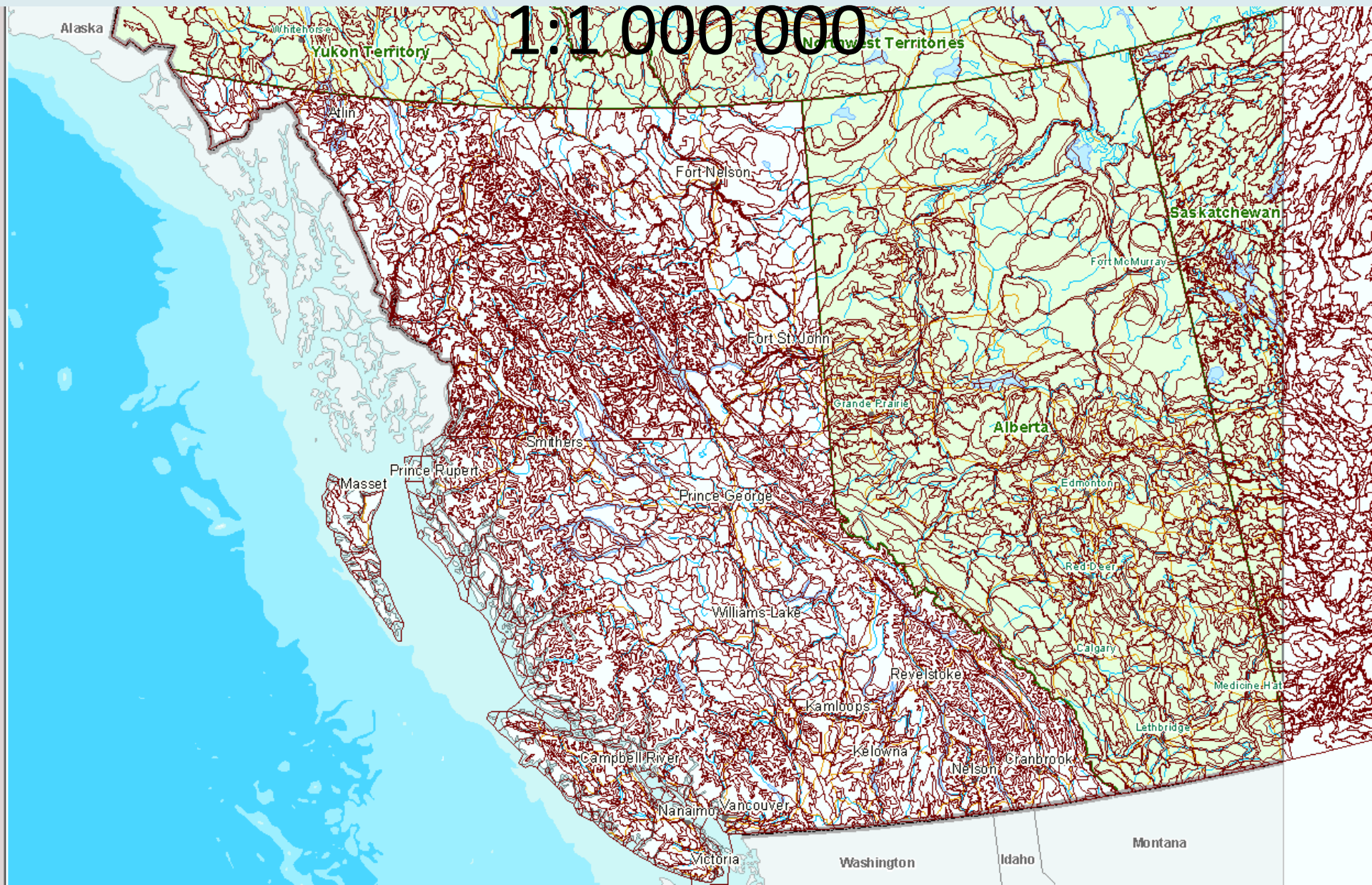
FEDERAL
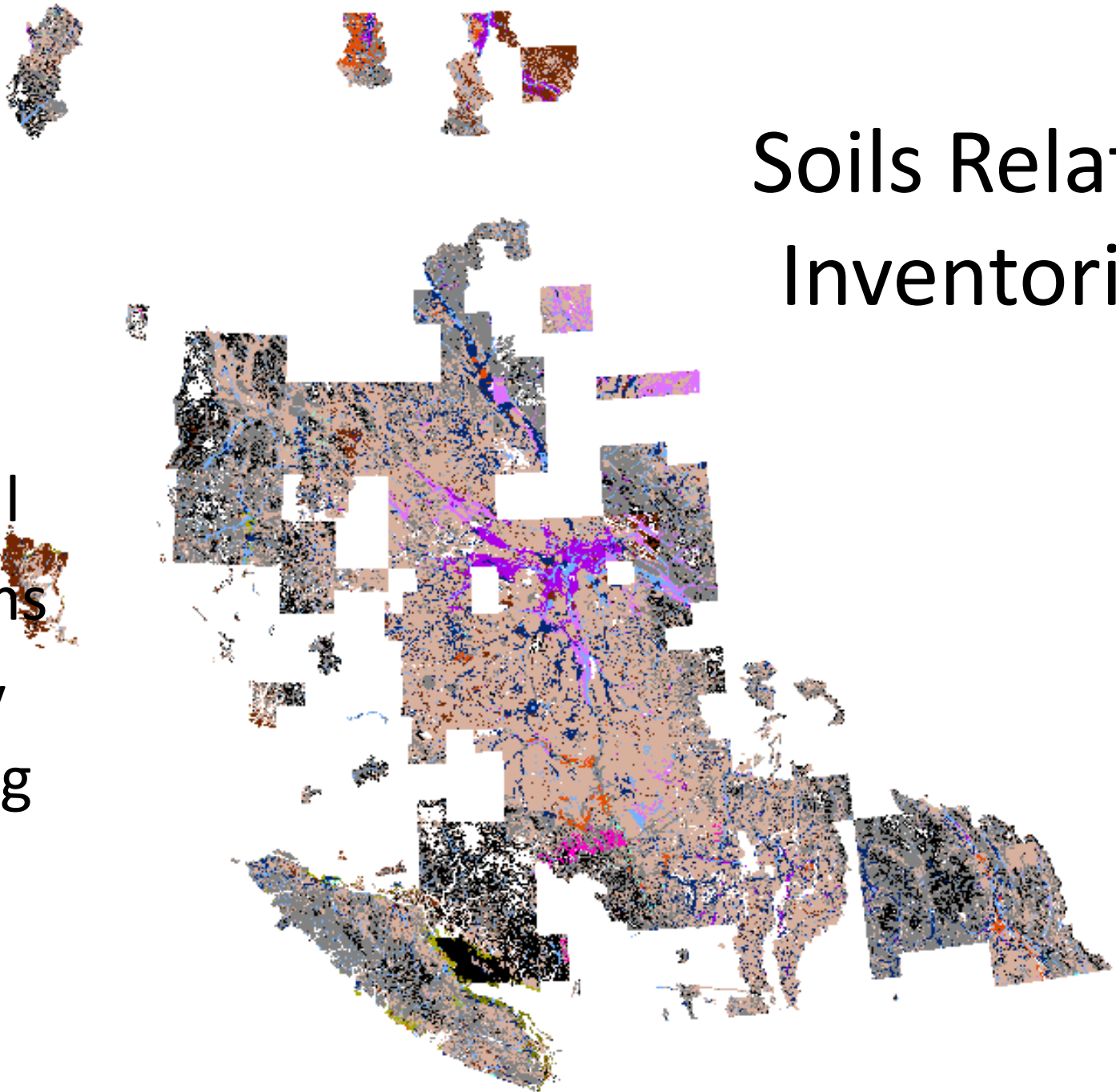1:50 000 – 1:100 000 Published MAPS

SOILS OF BC
1:50 000 DRAFT MAPS

Soils Related Inventories

Surficial material

Ecosystems

Capability mapping

Polygon Attributes

- Polygons often delimit repeated patterns of soils in the landscape and are made up of multiple components
- Component attributes include
  - Soil name
  - Classification
  - RZPS
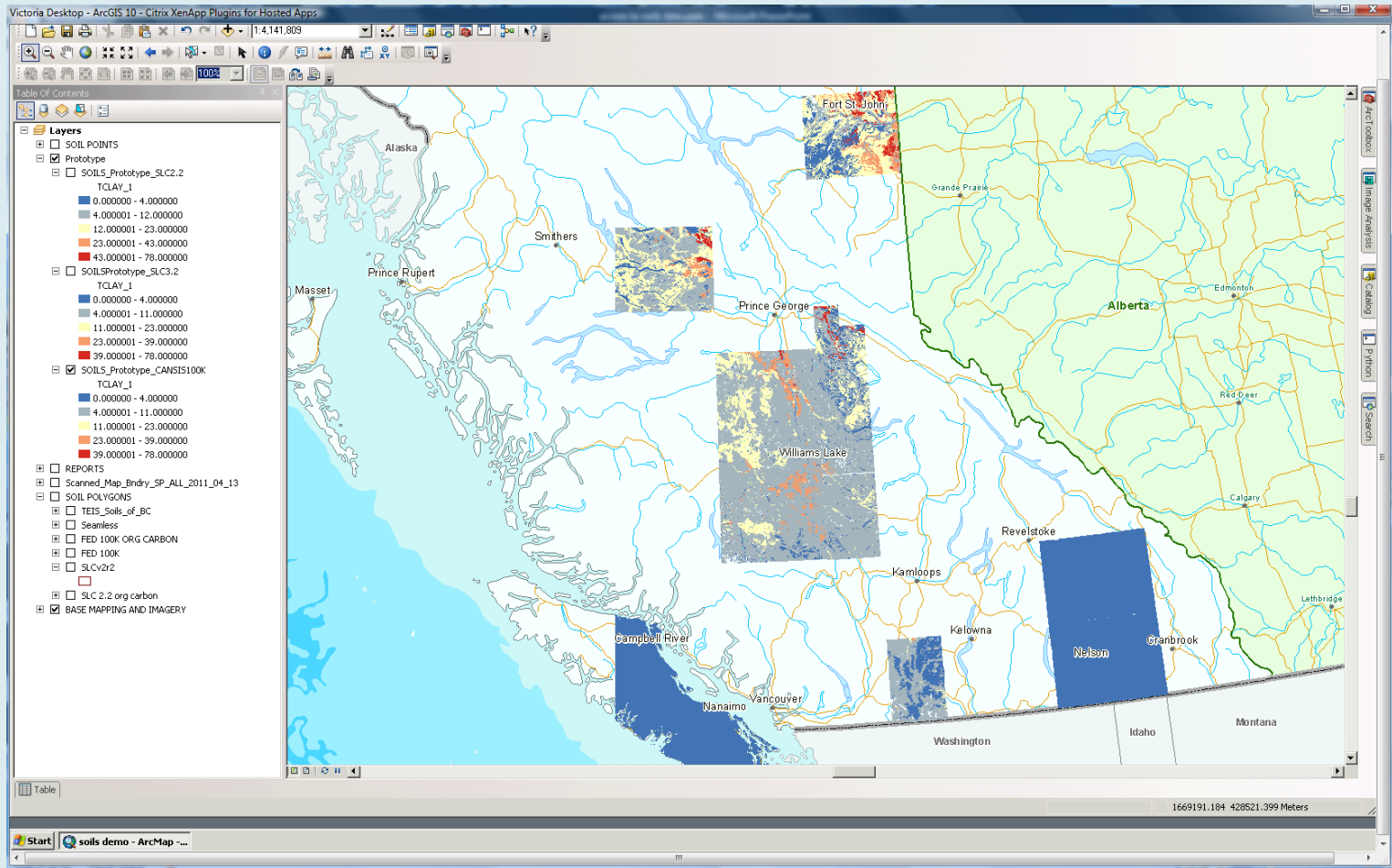
3.1 Question – Other Sources of Data

- What other sources of data are there?
- Are they being managed in a centralized repository?

Mapping Soils Characteristics
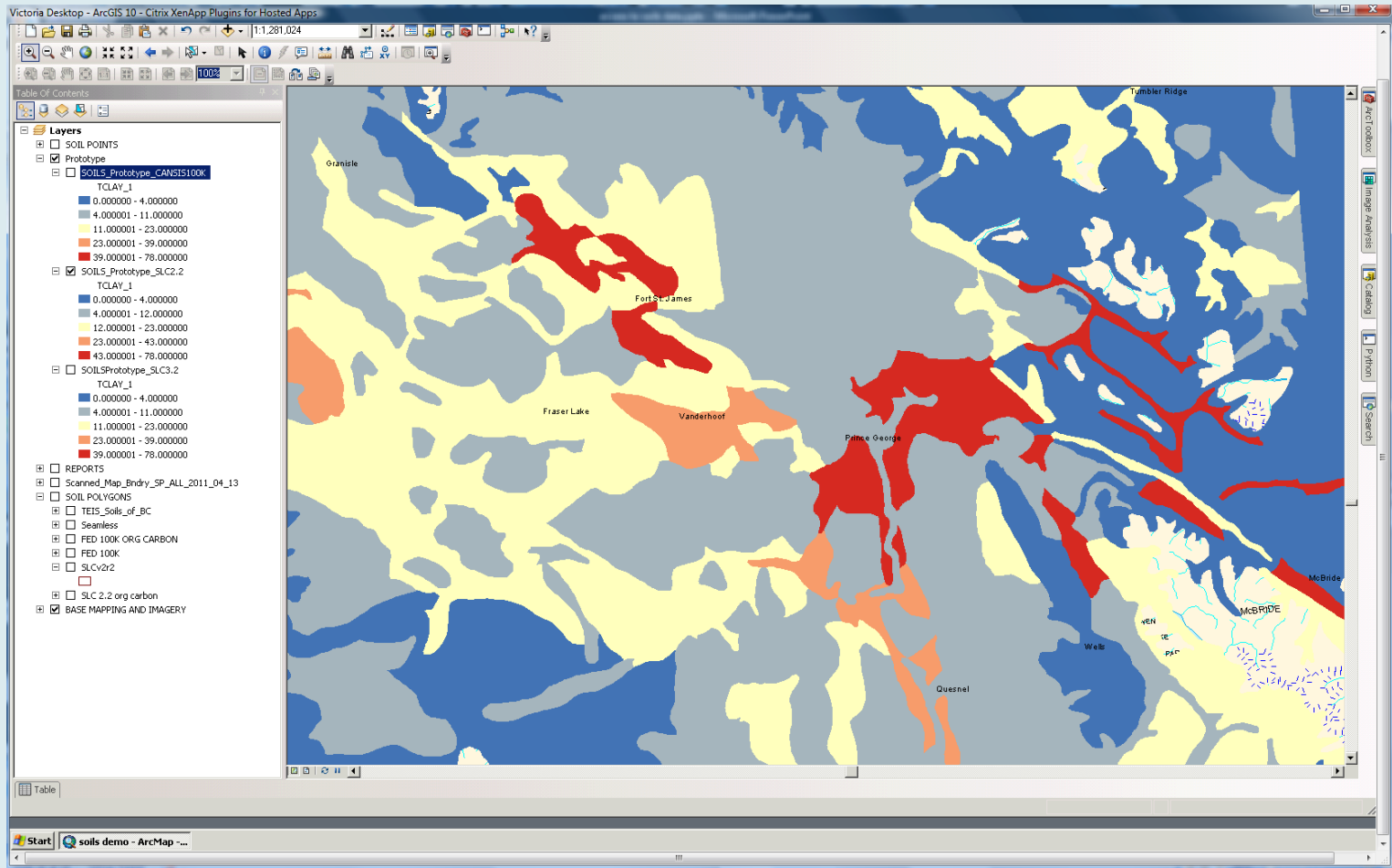
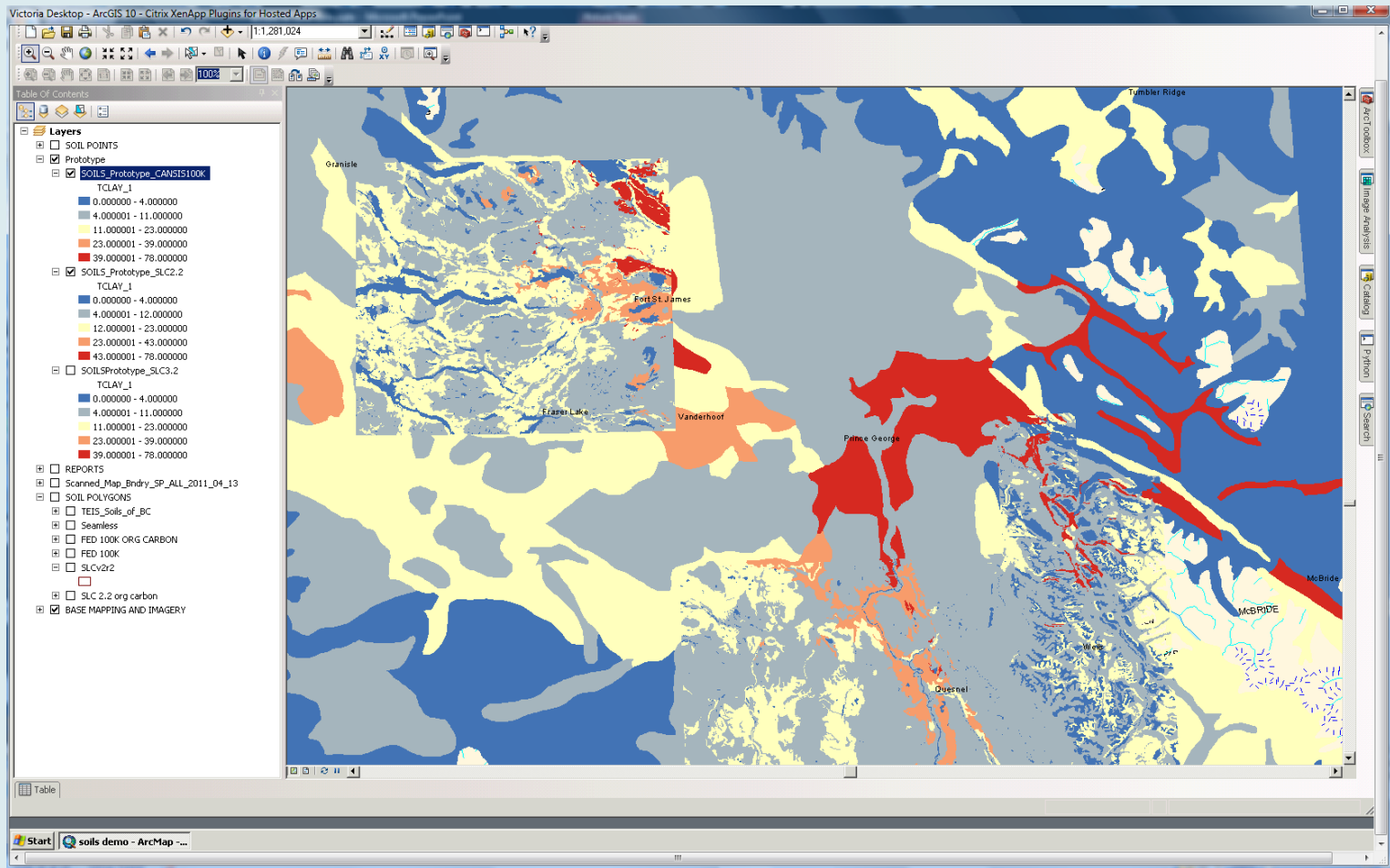The example of clay content..........

Soil Data Themes
e.g., % clay content

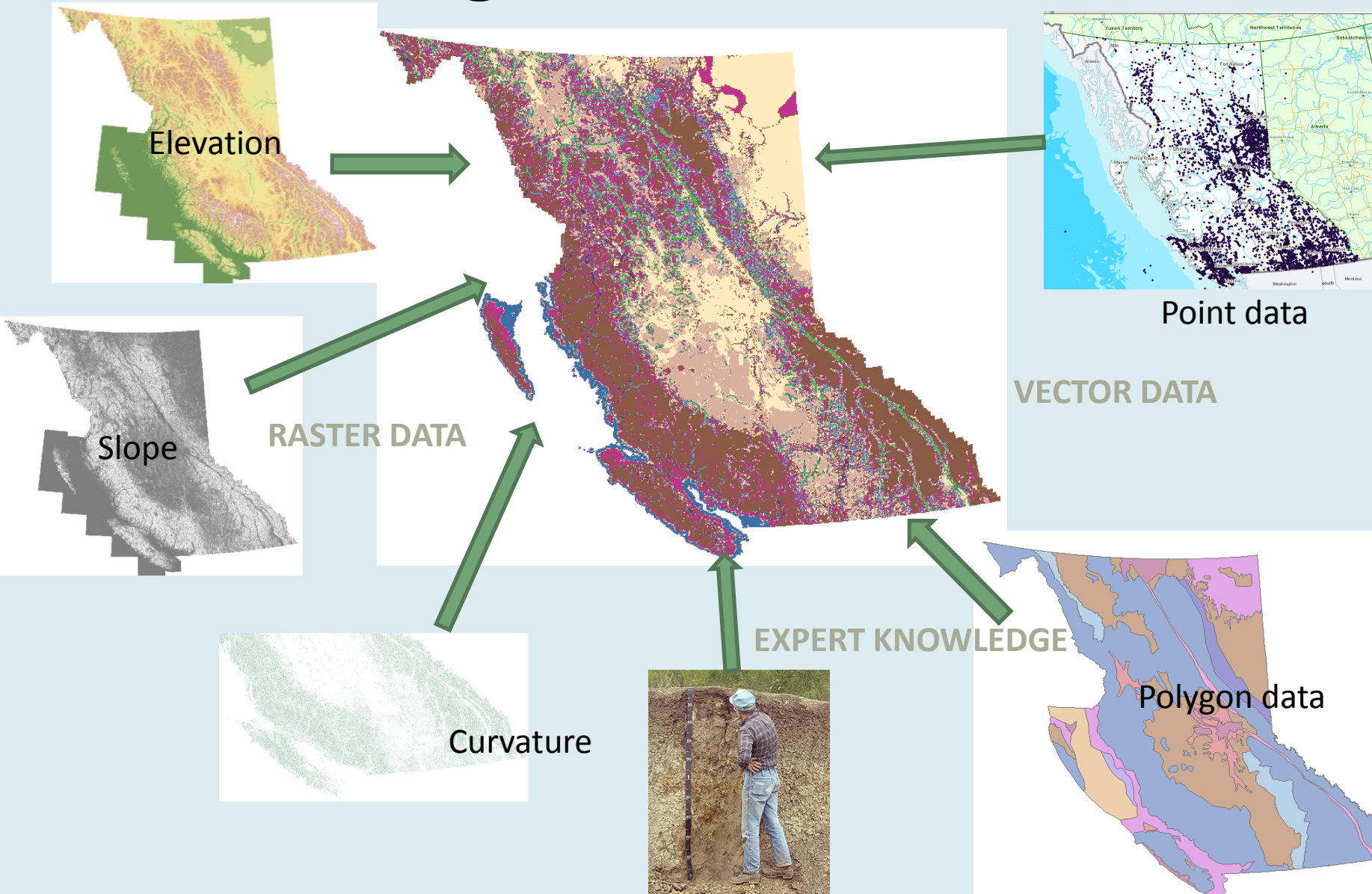# %Clay Content of 1ˢᵗ Soil Component
1:1 000 000

%Clay Content of 1ˢᵗ Soil Component
1:1 000 000 and 1:100 000

Predicting Soils Characteristics

Elevation

Point data

Slope

RASTER DATA

VECTOR DATA

Curvature

EXPERT KNOWLEDGE

Polygon data

Soils Indicators

- **Ideal indicators should:**
- correlate well with ecosystem processes
- integrate soil physical, chemical, and biological properties & processes
- be accessible to many users
- be sensitive to management & climate
- be components of existing databases
- be interpretable

INDICATOR of what?

– Drivers

– Stressor indicators

– State of Quality and Quantity

– Function

Soil indicator types relating to soil function

- Chemical
  - Nutrient cycling, water retention, buffering
- Physical
  - Stability and support, water relations, habitat
- Biological
  - Biodiversity, nutrient cycling, filtering

FREP indicators

1. Lost productivity due to access construction

2. Landslides, erosion, and drainage diversion

3. Dispersed soil disturbance in the net area to be reforested

4. Green tree retention (to support beneficial soil biota such as

mycorrhizae)

5. Organic matter retention (BCMoF 2008d).

3.2 Questions – Landscape Level

1. What is your NIRVANA for soils at the landscape level?

2. List some landscape level indicators and what they indicate.

3. Choose a subset from the list that you believe are practical and doable.

4. List data needs for your top 3 landscape level indicators

3.3 Questions – Site level

1. What is your NIRVANA for soils at the site level?

2. List some site level indicators and what they indicate.

3. Choose a subset from the list that you believe are practical and doable.

4. List data needs for your top 3 site level indicators.

3.4 Questions – Inventory

1. What is your NIRVANA for soils inventory in BC?
2. List some soils characteristics at the polygon, site and horizon level.
3. Mark the ones you believe are practical and doable.
4. Which ones would you like to see a provincial coverage of?
5. Which ones should be collected at the site level as a requirement of permitting, licensing EAO etc.?