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Creating a Seamless Soil Data Set Okanagan British Columbia

2010 Western Region National Cooperative Soil Survey
Conference

Las Vegas, Nevada
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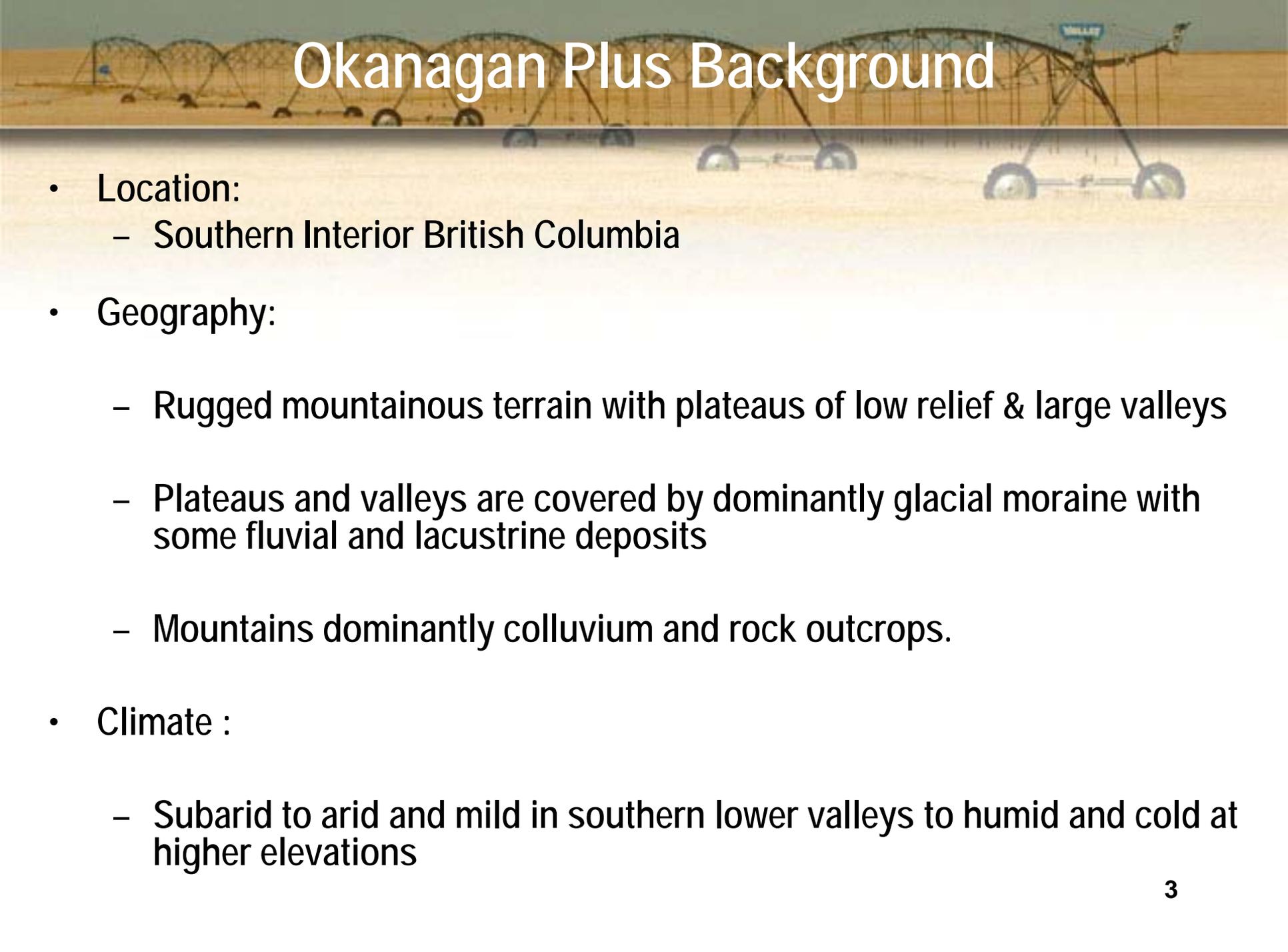
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Outline Okanagan Plus Project

- Define & Describe area
- Okanagan Basin subset of Okanagan Plus
- Need for Seamless dataset
- Identify Steps For Seamless
- Examples of Seamless Issues
- Attribute Data Harmonization
- Applications
- Conclusions



Location of Project Area 2

A background image showing a large-scale irrigation system, likely a center pivot system, in a dry, agricultural field. The system consists of multiple wheels connected by a central line, with long metal arms extending from them to support a series of parallel pipes. The ground is light-colored and appears to be a mix of soil and sand. The sky is a pale, hazy blue.

Okanagan Plus Background

- Location:
 - Southern Interior British Columbia
- Geography:
 - Rugged mountainous terrain with plateaus of low relief & large valleys
 - Plateaus and valleys are covered by dominantly glacial moraine with some fluvial and lacustrine deposits
 - Mountains dominantly colluvium and rock outcrops.
- Climate :
 - Subarid to arid and mild in southern lower valleys to humid and cold at higher elevations

Landscape



McIntyre Bluff South Okanagan

Landscape



Landscape Valley Floor to High Elevation

Drivers: Okanagan Plus Seamless Dataset



- Okanagan Basin - subset of Okanagan Plus
 - Increased activity in water demand modeling and climate change modeling
 - Agriculture and Agri-Food Canada Summerland leading a climate change study concerning impacts of climate change on future production of high value woody perennial crops
 - Modeling activities require harmonized soil attribute dataset



New Seamless Dataset Inputs

Data Set	Scale	Projection	Vintage
Vernon	1:50 000	Geographic NAD 83	1986
Penticton	1:50 000	Geographic NAD 83	1986
Seamless (Detail)	1:20 000, 1:31 680	UTM Zone 11	1986, 1960
Tulameen	1:126 720	Geographic NAD 27	1974

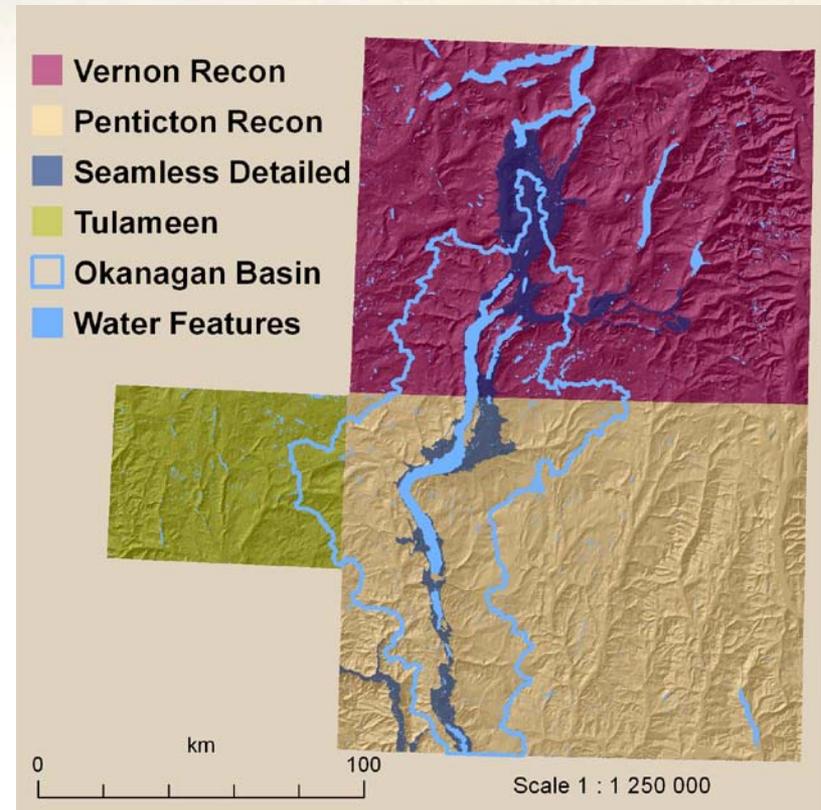


New Seamless Dataset Inputs

Data Set	Number of Polygons	Total Area in Hectares	Mean Polygon Area in Hectares
Vernon	2404	1,213,889	505
Penticton	3430	1,610,781	469
Seamless (Detail)	9987	145,174	15
Tulameen	666	400,835	602

Dataset Inputs Assembled into GIS

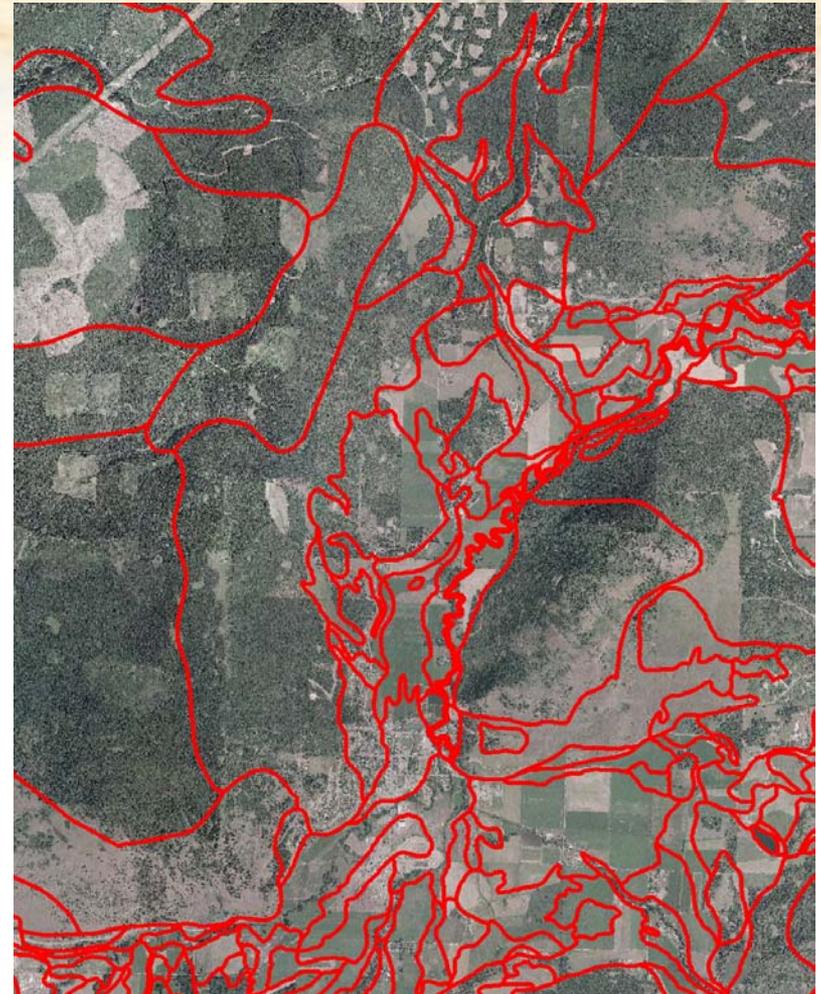
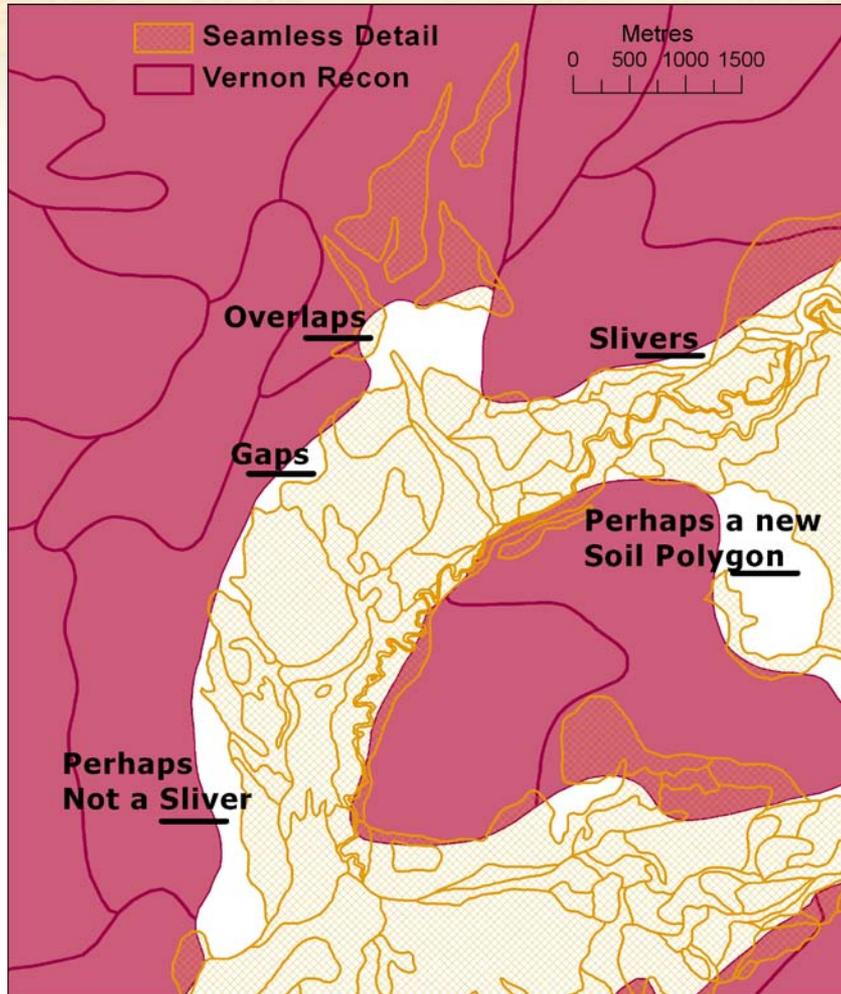
- Requires Several Steps:
 - Common projection
 - UTM Zone 11 NAD 83
 - Edge matching check for
 - Polygon matches
 - Slivers
 - Gaps
 - Overlaps
 - Define GIS rules
 - Check maps for holes & gaps
 - Common data base structures
 - Correlation



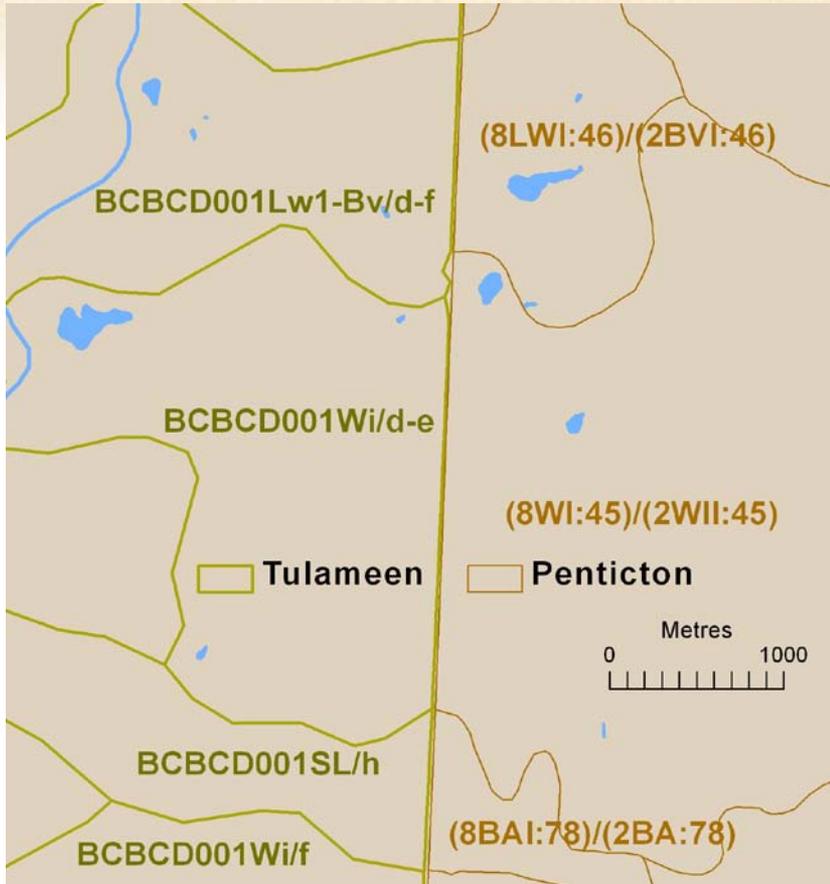
GIS Rules to Follow for Seamless Dataset

- Detail takes precedence over reconnaissance
- Newer reconnaissance mapping takes precedence over older reconnaissance mapping
- Penticton mapping takes precedence over Vernon mapping
- Use topology rules
 - Polygons cannot overlap
 - Cannot be gaps between polygons
 - No holes in dataset
- Orthoimagery, available as WMS layer from the Province of BC, was used as an underlay to aid in edge-matching
- Verification of accuracy of new polygons was done with Google Earth by examining polygons with a 'tilted' perspective

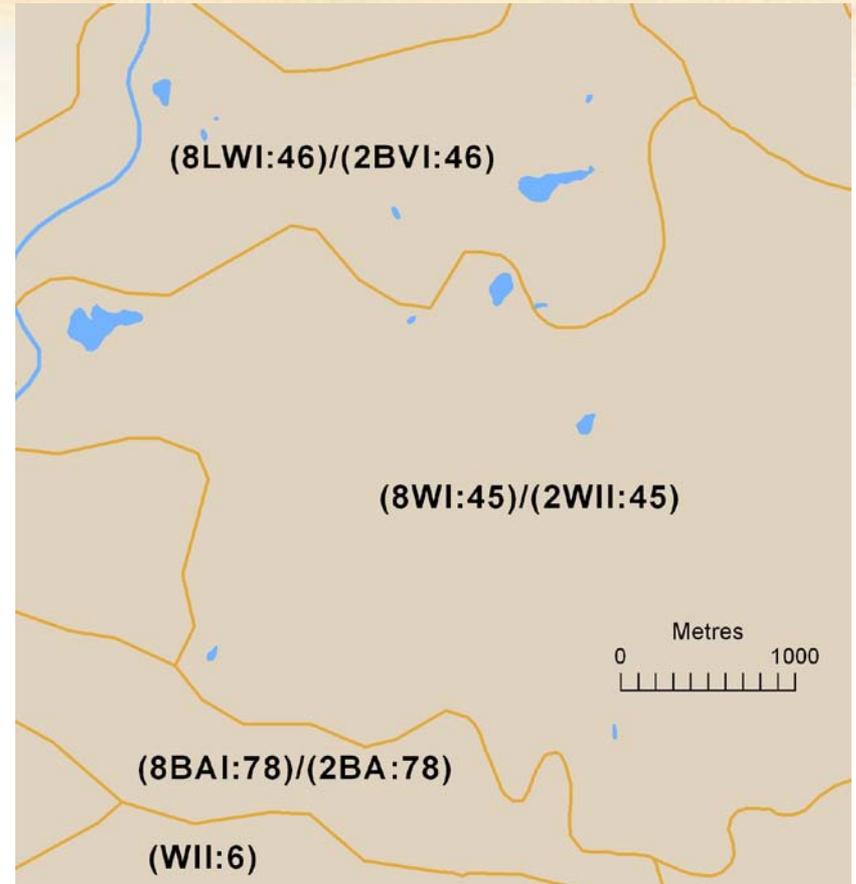
Sample Issues Resolved



Tulameen - Penticton Edge Before & After

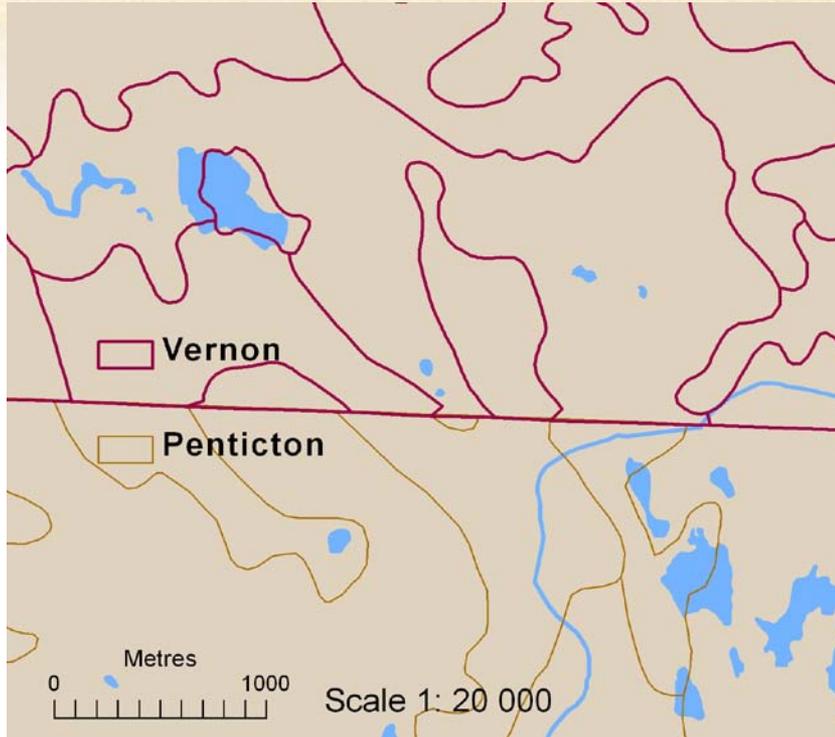


Before Edge Match



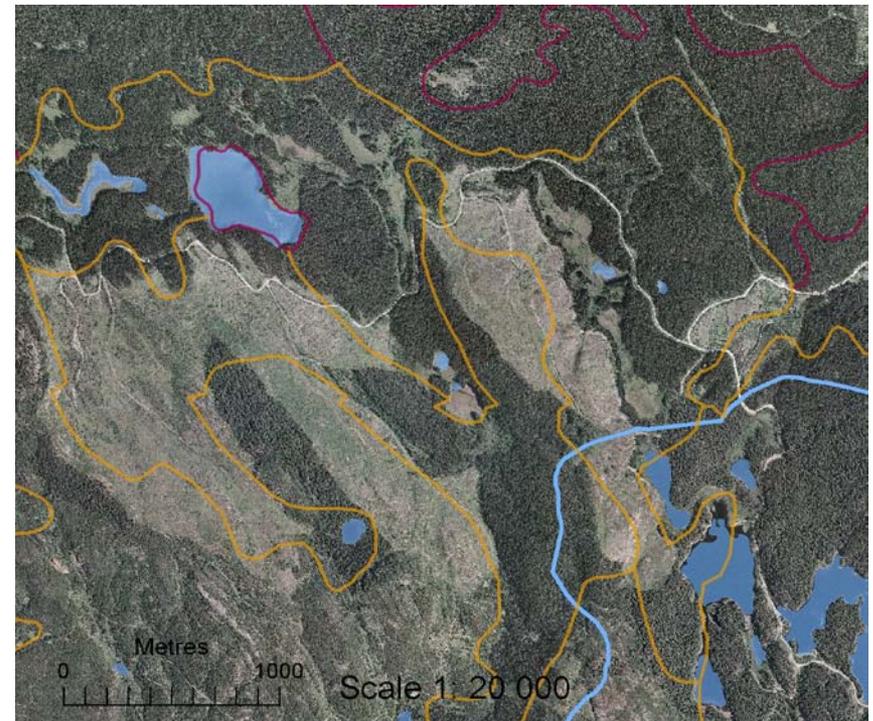
OK Plus Final Product₁₂

Vernon - Penticton Edge



Vernon lines also not aligned with water features

Final product showing good match to ortho photo below

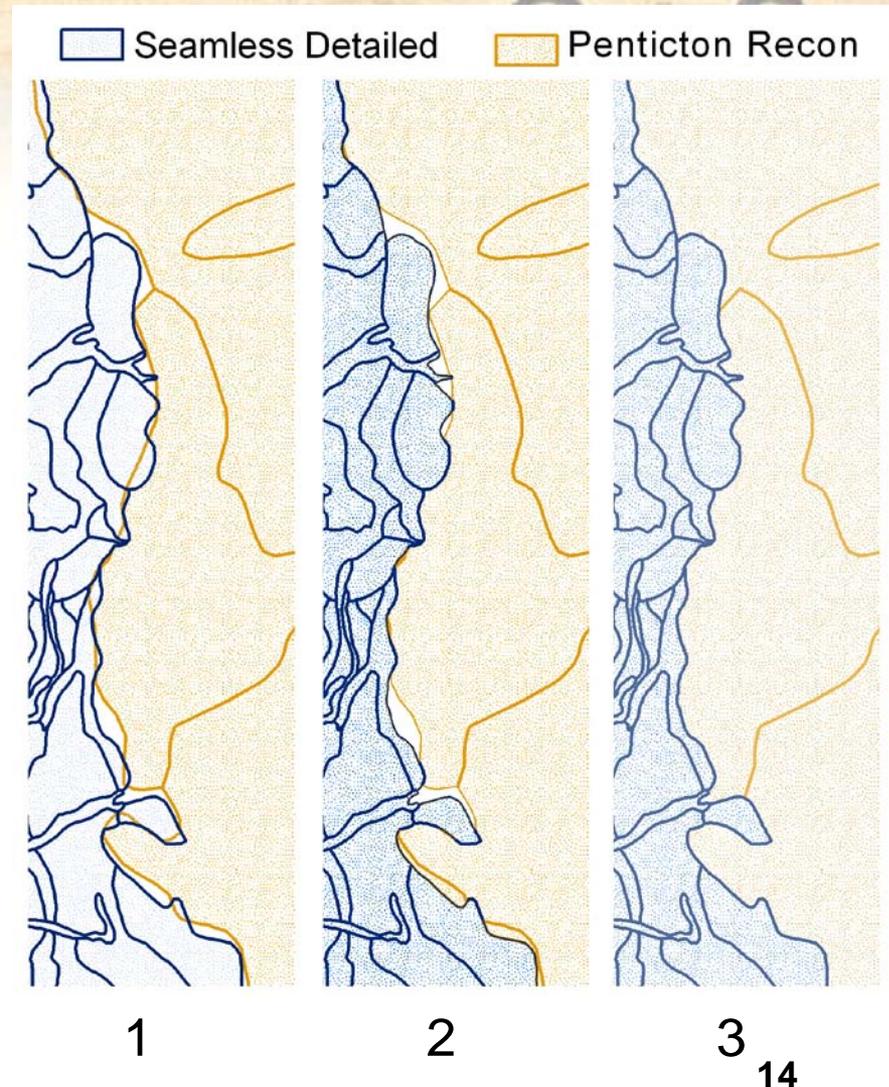


Apply GIS Rules: Update Gaps & Overlaps

1: Seamless and Penticton Edge

2: Penticton Edges clipped by overlapping Seamless polygons

3: Gaps between Seamless and Penticton merged into adjacent Penticton polygon



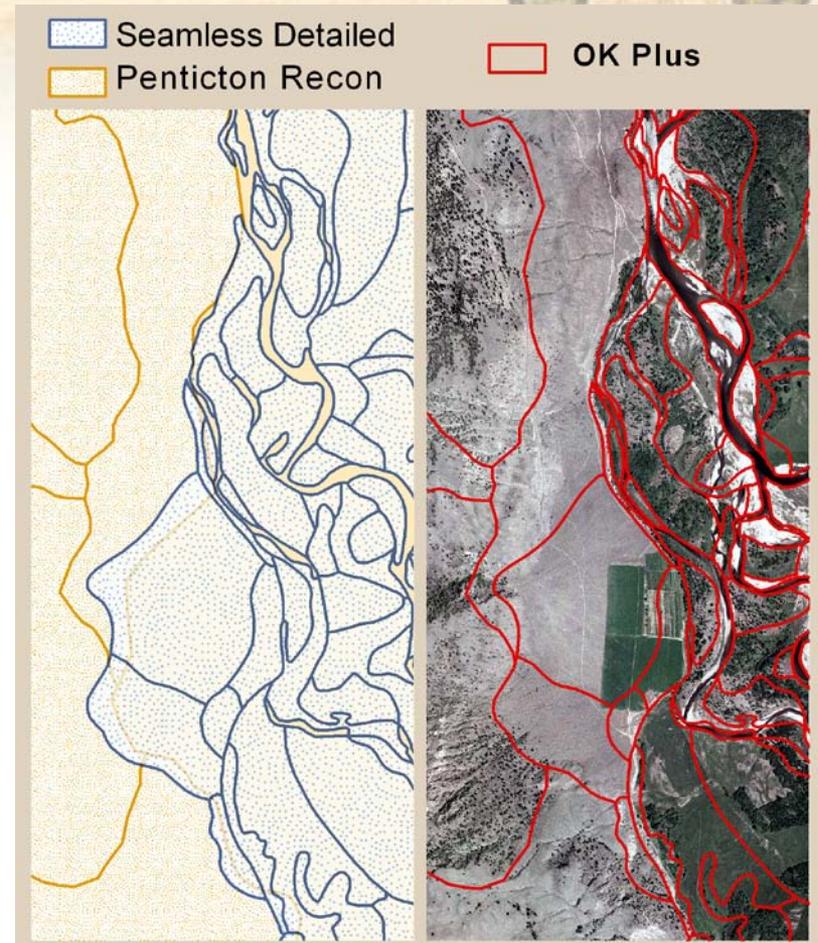
Adjusting River Alignment

**Seamless overlapped by
Penticton**

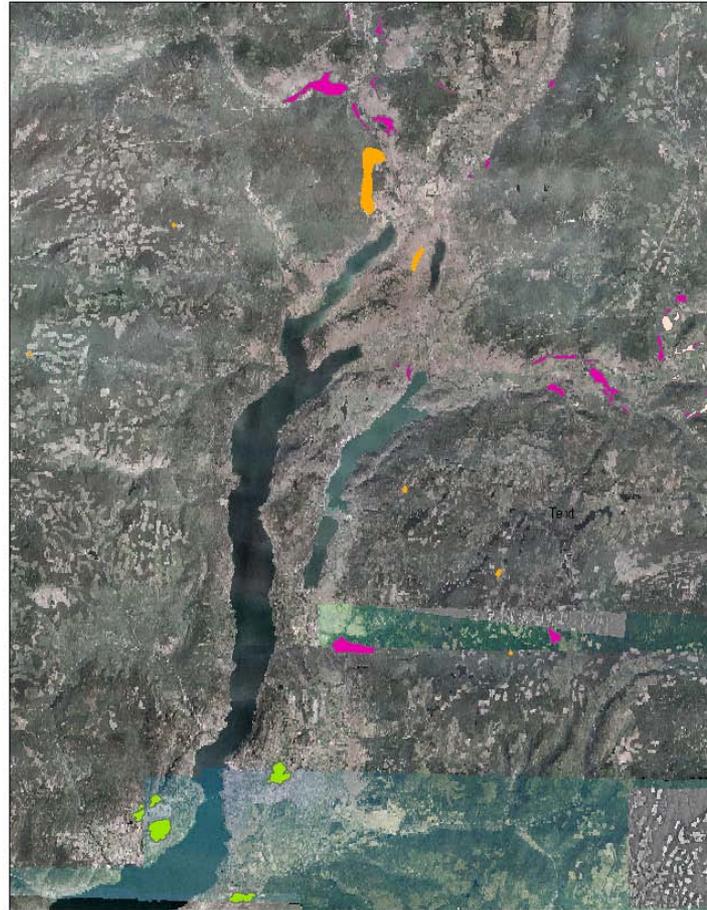
Gaps in the Seamless data

**Polygons not aligned with
river**

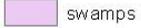
On the right : Final product



Data Checking: Use Separate Layers



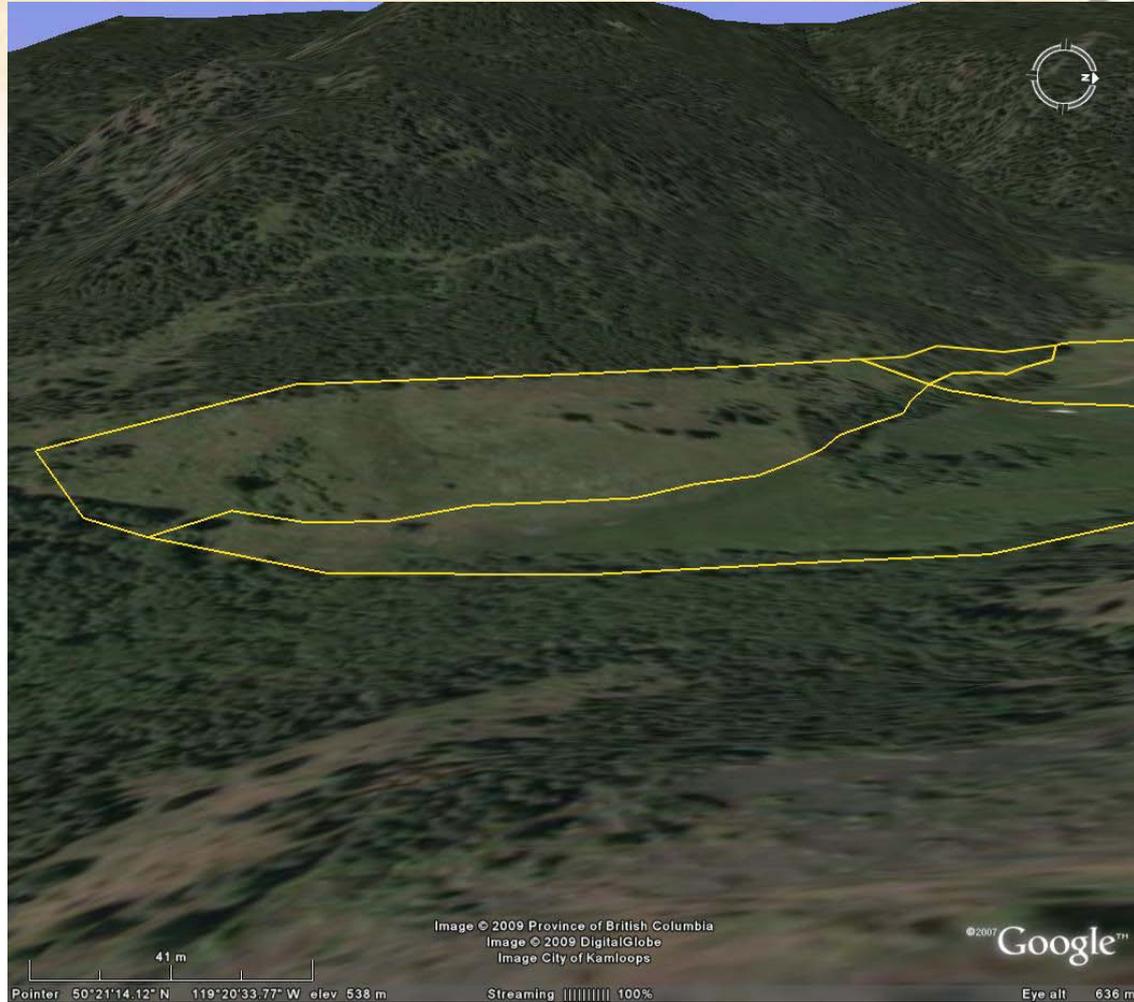
Legend

 swamps	 BigGaps
 unknown	 NeedMUN
 Steep	 NSGaps

0 12,500 25,000 Meters



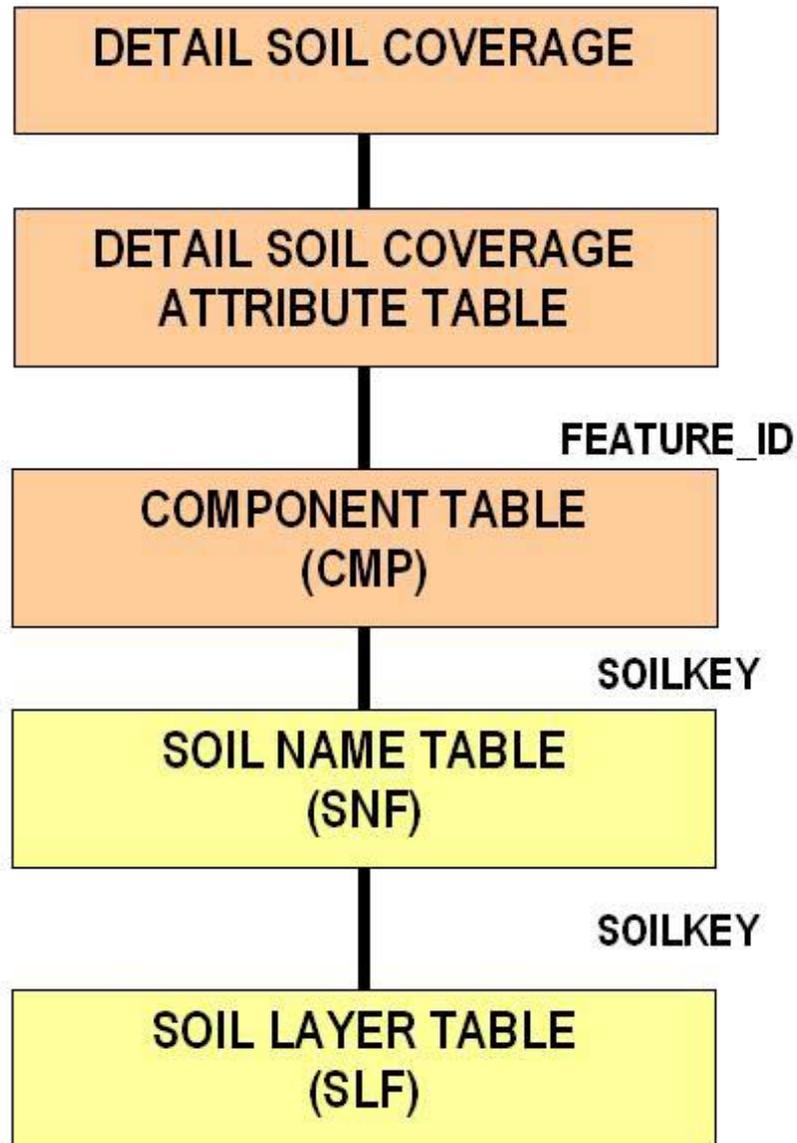
Data Checking: Use Google Earth



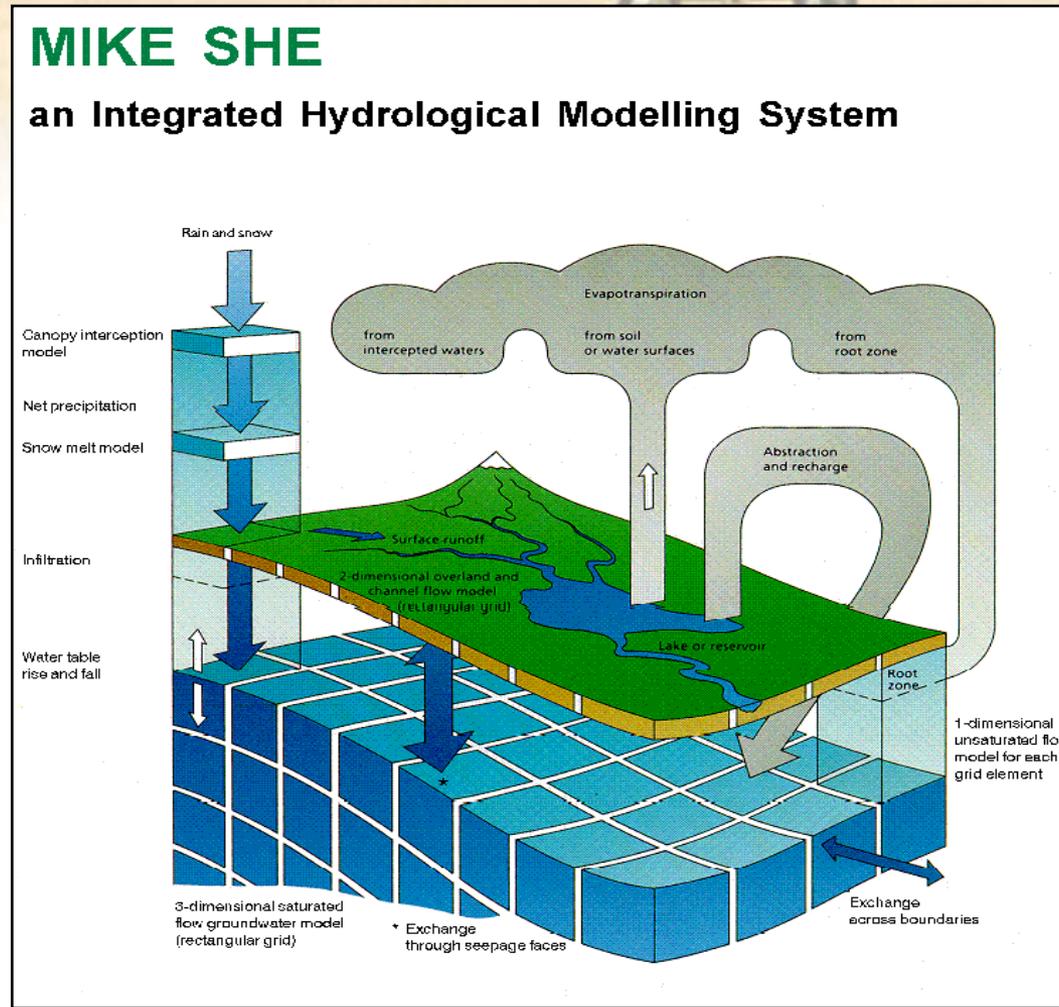
Database Harmonization for Seamless Dataset

- Harmonization of the Attribute data
 - Define new data base structure for seamless dataset
 - Define data structure such that models such as LSRS will run
 - Need CANSIS data formats our National file structure
 - Need to ensure all soils in component file also occur in soil layer and soil name file
 - Validate attributes in soil data files & correlation

Data Model Okanagan Harmonized Dataset

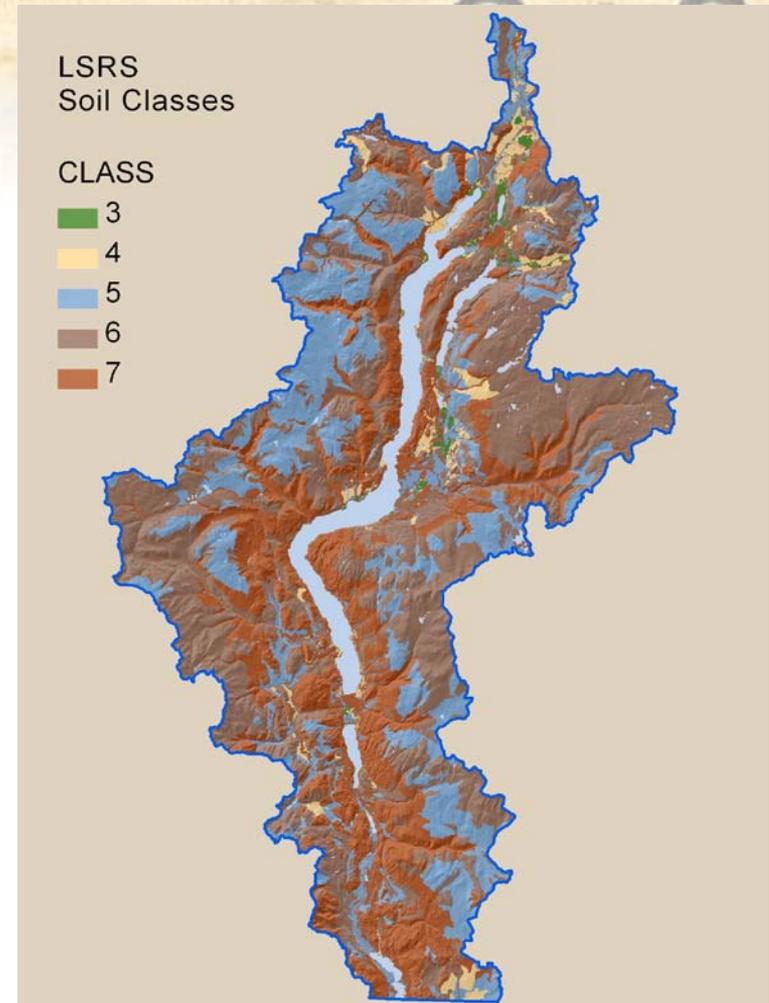
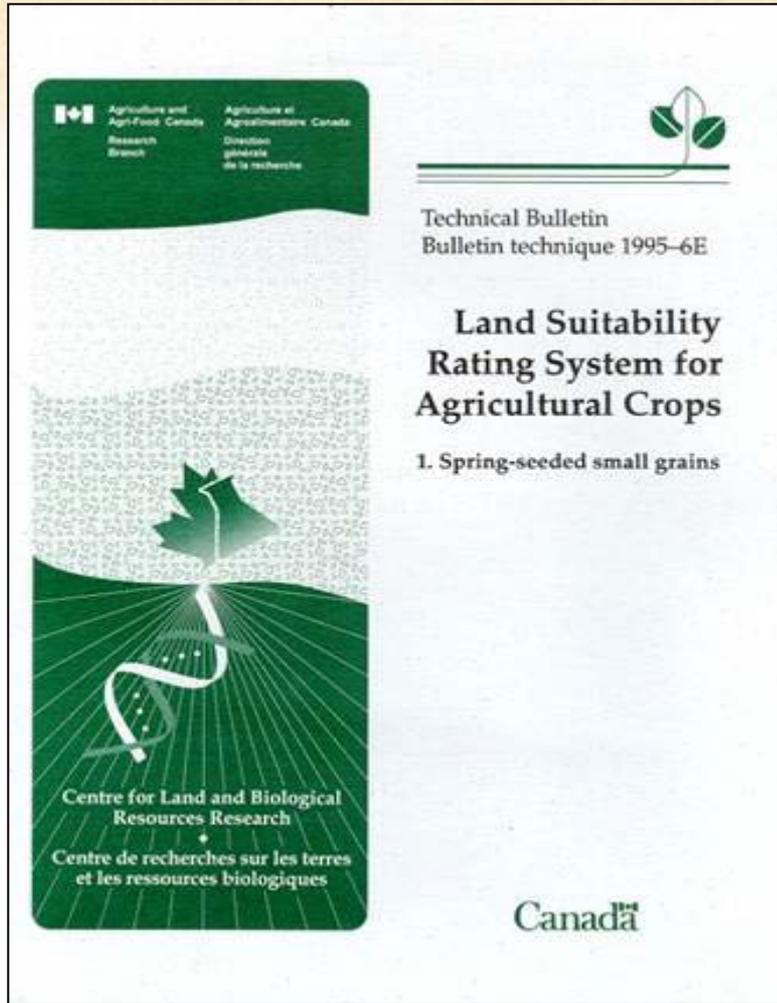


Application of Seamless Dataset: Hydraulic Modeling

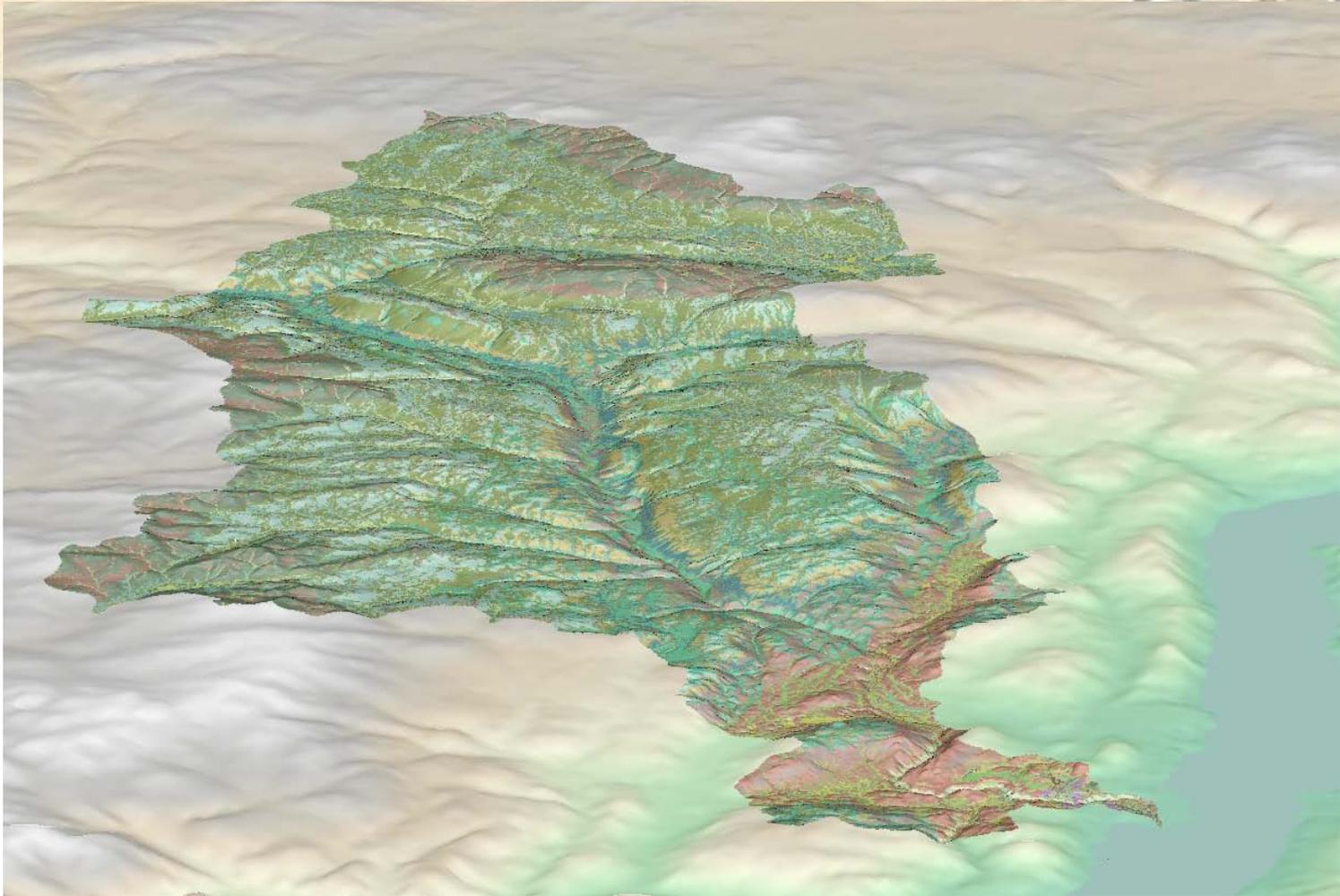


Model covers all land-based phases of hydrologic cycle 20

Application of Seamless Dataset: LSRS



Application of Seamless Dataset: Digital Soil Map

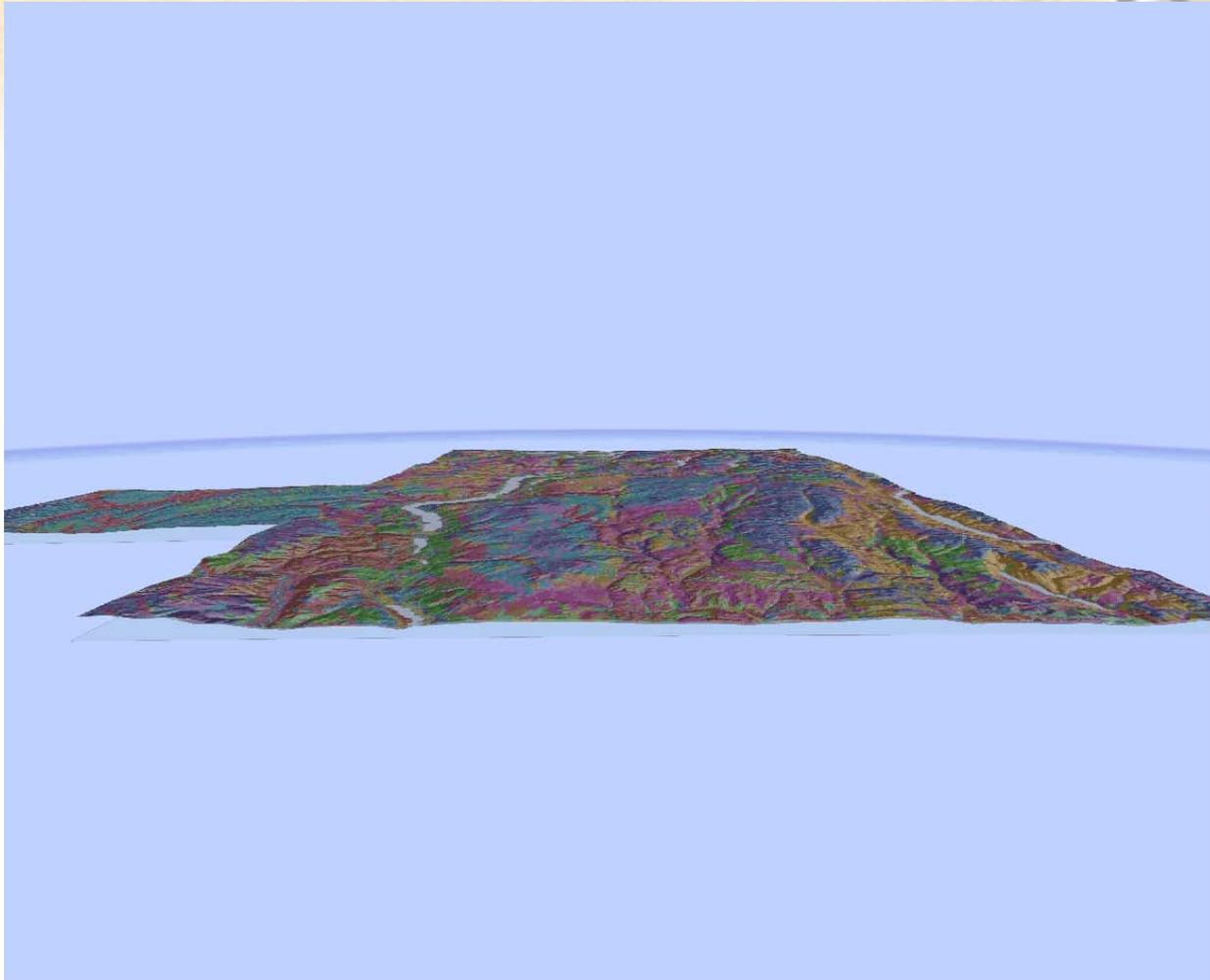




Conclusions

- Collaboration between GIS staff and Soil Surveyor ideal
- Having the ortho photo layer in GIS necessary
- New seamless data set for Okanagan Plus available for
 - LSRS testing
 - Testing new digital soil predictive mapping conducted for Southern BC
 - Habitat analysis for species at risk under climate change
 - Hydrology Modeling

Okanagan Plus Overview





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