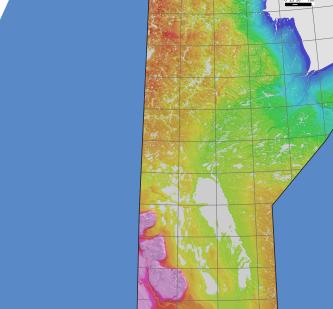
Applications of Surficial Geology data



Surficial geology maps provide information on: Areal distribution of different sediment types Hazards Till composition <u>Drainage</u> Geologic origin (genesis) glaciofluvial till: basal ablation/melt-out marine Geomorphology (landform) fluvial plain (washed esker) escarpment

Derivative maps

Aggregate

Aggregate potential maps can be generated from surficial geology maps, by highlighting polygons classified as: -esker, kame, terrace (glaciofluvial)

-delta, fan-delta, fan (glaciolacustrine, glaciomarine, glaciofluvial)

-beach ridge (glaciolacustrine, glaciomarine)

Post-glacial (fluvial, alluvial, lacustrine, marine) deposits may also provide aggregate.

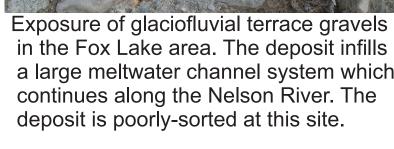
*Variations such as clast abundance, clast quality (granitoid vs carbonate) and degree of sorting, mean that any 'potential aggregate' polygons must be field-verified to confirm quality.

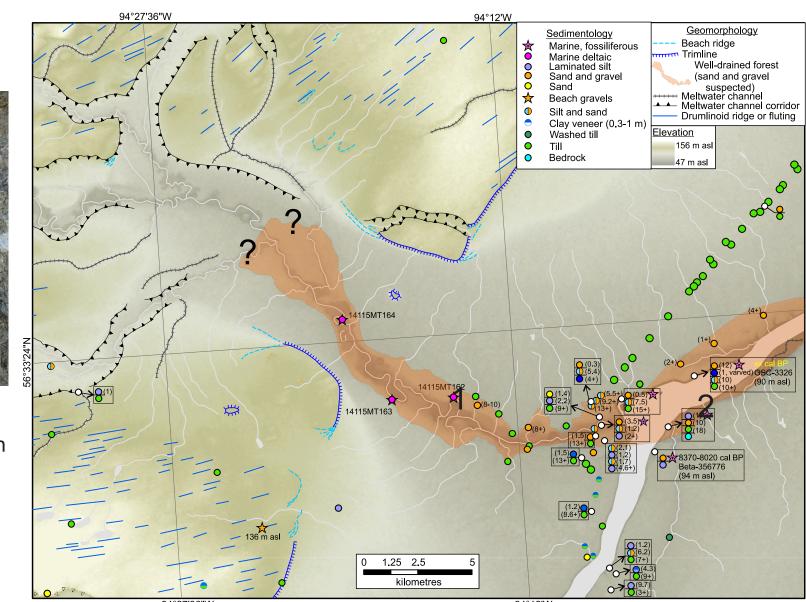




extending along the Limestone river







over stronger till: Churchill River (summer 2014)

of assessing:

landslides.



above Paleozoic bedrock; Churchill River (summe

Bedrock outcrop location

a) Erosion potential, based on soil texture and slope.

The majority of Manitoba is covered by Quaternary sediments. Surficial geology maps capture the location of bedrock outcrops, and can be a good source to use when planning a bedrock field project. Keep in mind that older pre-GPS maps may have "suggested" rather than actual

Hazard: Surficial geology maps can be used as a 'first pass' method

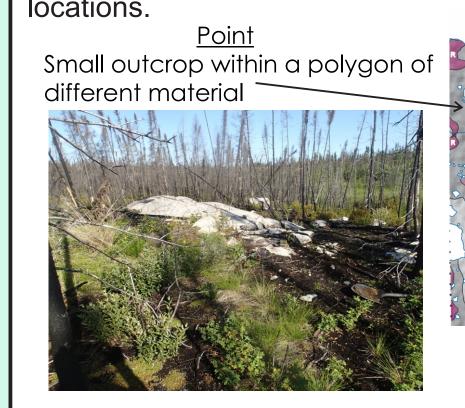
Once the vegetation cover is removed, the

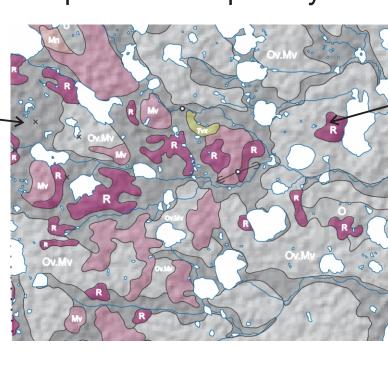
Each sediment type responds differently t

overland/groundwater flow.

b) Terrain stability, based on identification of existing colluvial deposits, and/or

sediment is exposed to water erosion through



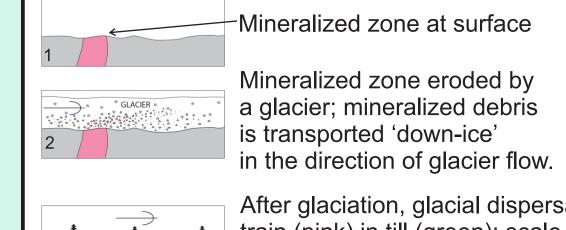


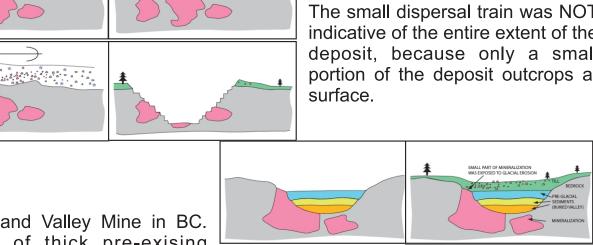


*Remember that maps are a mixture of air-photo interpretation and ground-truthing. Data is 99% trustworthy only if there is a field-site symbol. If not....user beware.

Drift prospecting (Modified from GSC Open file 7261)

The mineral and chemical composition of till samples can be assessed for anomalous element enrichments, which can then be traced back to the bedrock source.





Stratigraphy is important!

After glaciation, glacial dispersal train (pink) in till (green); scale of dispersal depends on numerous

But remember that the lack of exposure of mineralization to glacial erosion might have limited glacial dispersal.

Based on Highland Valley Mine in BC sediment limits the amount of mineralized detritus that can be eroded and transported by the glacier.

Questions surficial geology can help to answer

Where to find the correct sampling material for drift exploration

Right of way routing (pipeline, powerline, road)

Hazard mitigation and/or avoidance during planning and construction -susceptibility to flooding, erosion (slope or surface), gullying, landslides, slumps, debris flows

Aggregate resource management -sand and gravel locations, size of potential deposits -field site data can provide detailed grainsize information

Construction-material sourcing (clay caps, carbonate-rich sediment, etc)

Initial outline of engineering characteristics (layering, plasticity, ground ice presence, depth to bedrock, boulder content....)

Land capability for agriculture (stonieness, clay content, relief, drainage)

Ecology and wildlife inventories (physical basis for soil and biophysical studies)



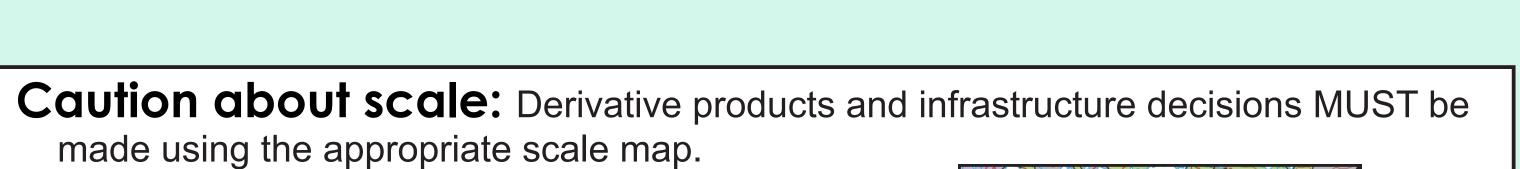


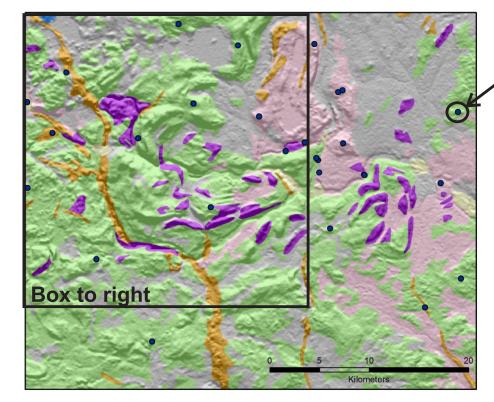




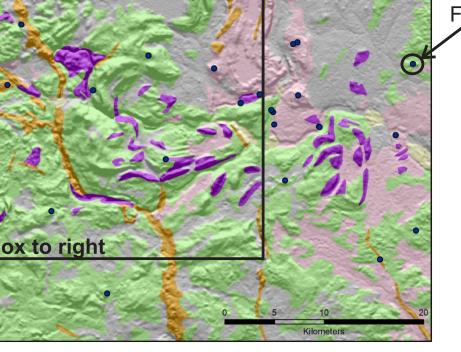








Simplified digital maps





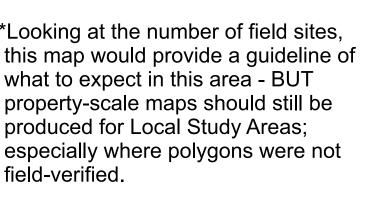


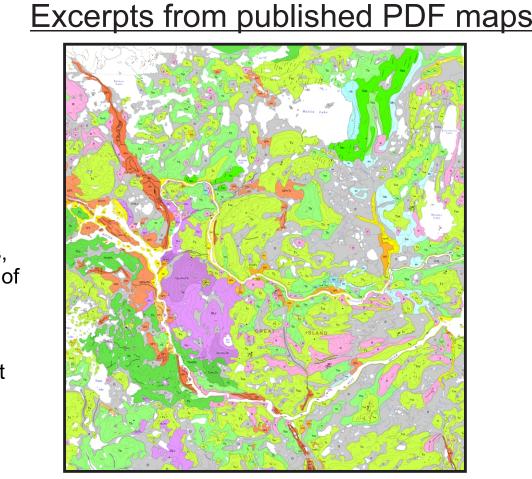
:500 000 scale map

-fewer field sites

-regional map data

-simplified labels





1:50 000 scale maps may be useful for regional projects, while 1:20 000 to 1: 5 000 scale maps will provide more accurate data for property-scale projects

Based on Gibraltar Mine in BC