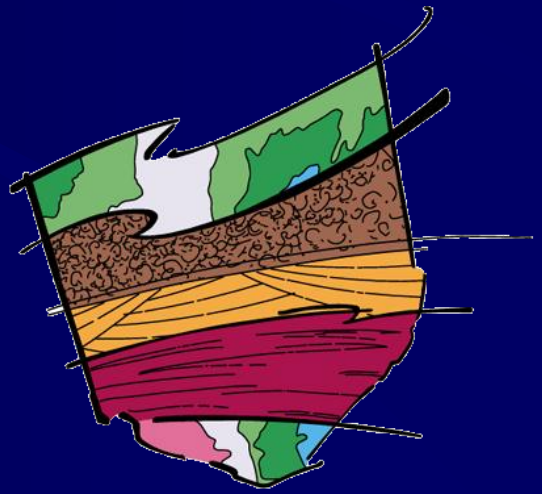
Ohio Department of Natural Resources

DIVISION OF GEOLOGICAL SURVEY

Ohio's 1:100,000 (30 x 60 minute) Quadrangle based derivative map program

Indianapolis - Jan. 15th, 2013

By: Mike Angle

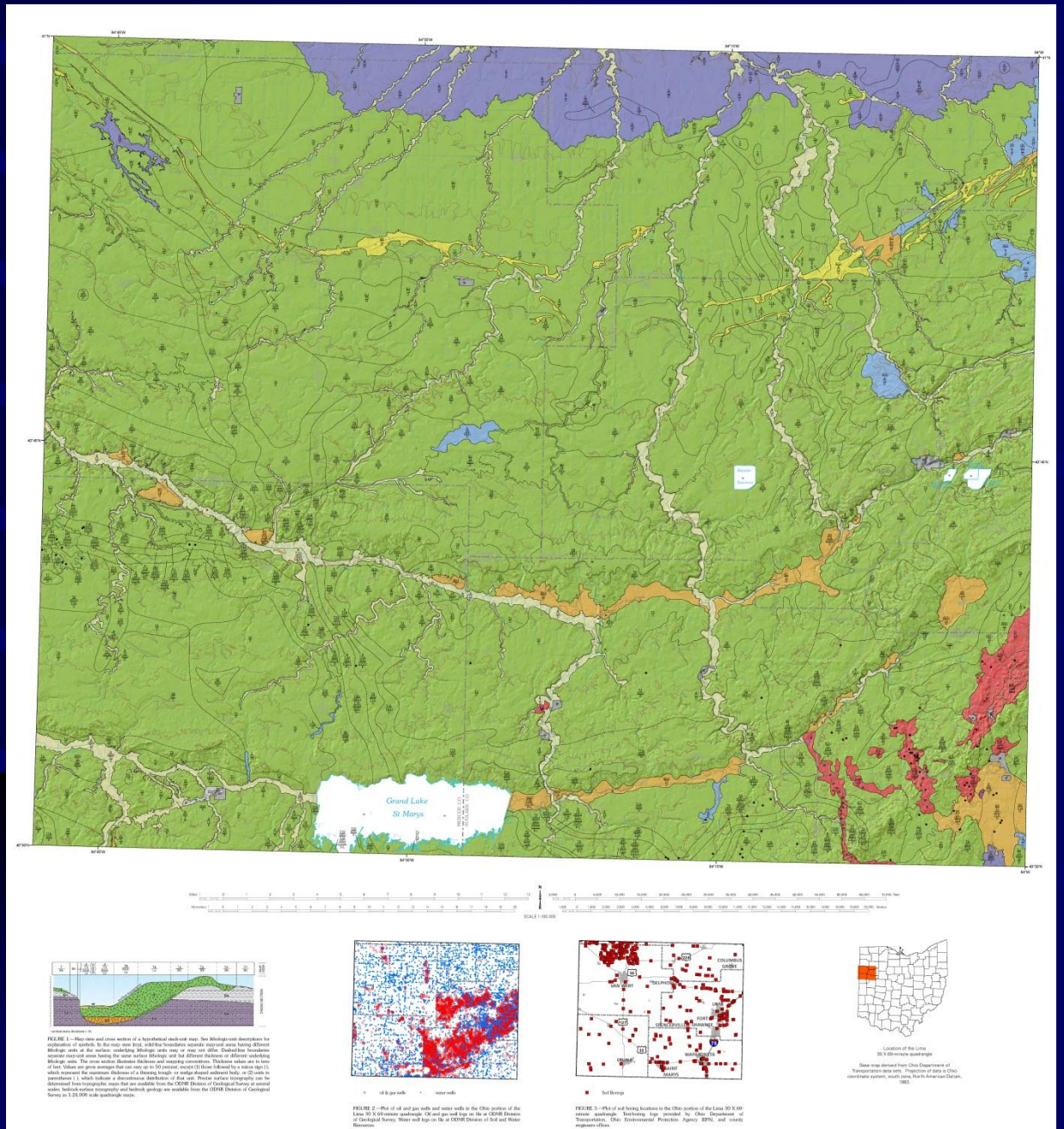


Overview of Topics

- Overview on Ohio's 1:100,00 scale surficial stack maps
- Overview on the types of derivative maps created
- Future derivative map ideas

Ohio's 100,000 scale Derivative maps

- Potential for mineable bedrock in the Marion 30 x 60' Quadrangle
- Potential for mineable bedrock in the Findlay 30 x 60' Quadrangle
- Sand & Gravel Resources for the Mansfield 30 x 60' Quadrangle
- Sand & Gravel Resources for the Can 30 x 60' Quadrangle
- Suitability for Solid-Waste Disposal for the Lorain 30 x 60 ' Quadrangle

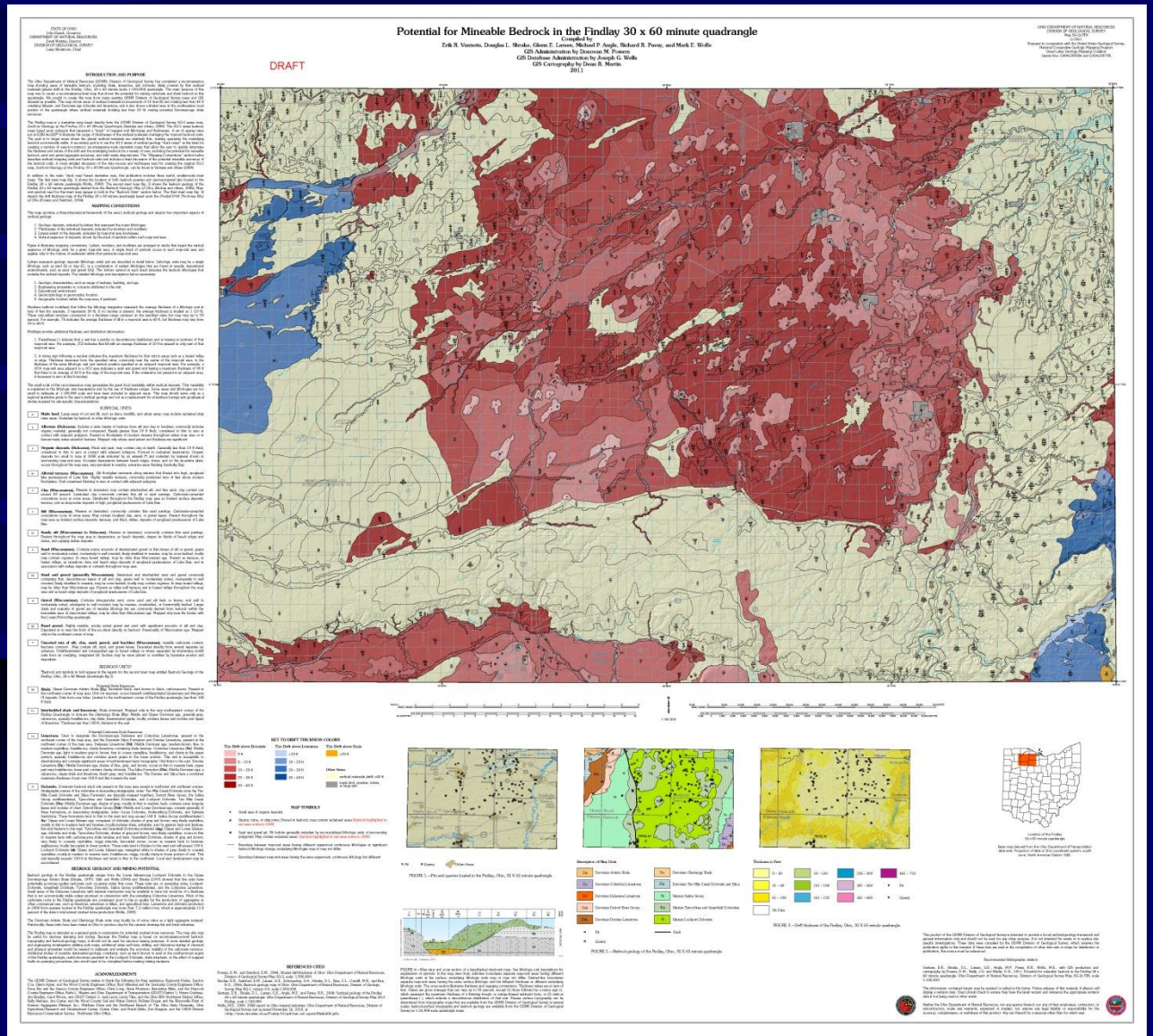


An example of the standard 30 x g60 minute quadrangle (1:100,0000 scale) surficial geology “stack-map” It is colorized based upon the uppermost surficial unit (i.e.- soil parent material)

Derivative Maps

- For derivative maps-a custom query is created. Polygons are then custom-colored based upon the result of the query
- The query may be relatively complicated due to the “many-to-one” nature of the stack of materials for each polygon
- Explanatory text and the inset maps help tell the story on how each map was created

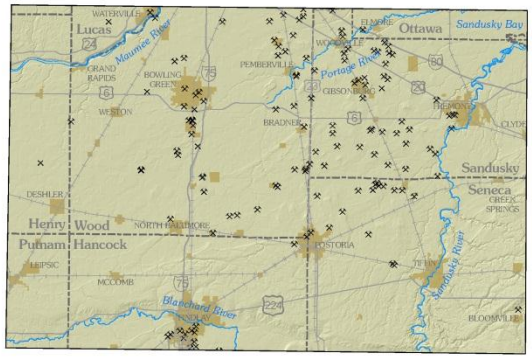
Derivative Map-Potential for Mineable Bedrock for the Findlay 30 x 60 Minute Quadrangle



Potential for Mineable Bedrock in the Findlay 30 x 60 minute quadrangle

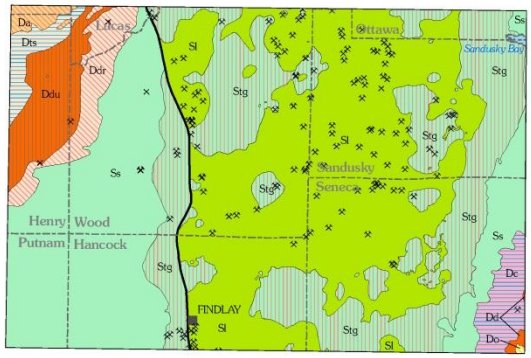
DRAFT

View of the inset maps that accompany the main map-In this case quarry locations, bedrock type, and drift thickness help tell the story



× Pit × Quarry Urban Areas

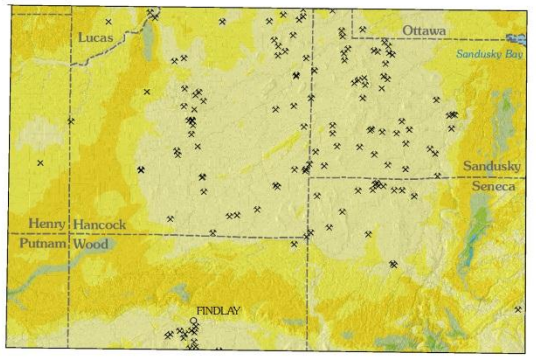
FIGURE 1.—Pits and quarries located in the Findlay, Ohio, 30 X 60 minute quadrangle.



Description of Map Units

Da	Devonian Antrim Shale	Do	Devonian Olentangy Shale
Dc	Devonian Columbus Limestone	Dts	Devonian Ten Mile Creek Dolomite and Silica
Dd	Devonian Delaware Limestone	Ss	Silurian Salina Group
Ddr	Devonian Detroit River Group	Stg	Silurian Tymochtee and Greenfield Dolomites
Ddu	Devonian Dundee Limestone	Sl	Silurian Lockport Dolomite

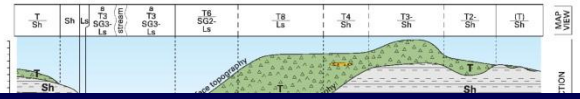
× Pit — Fault



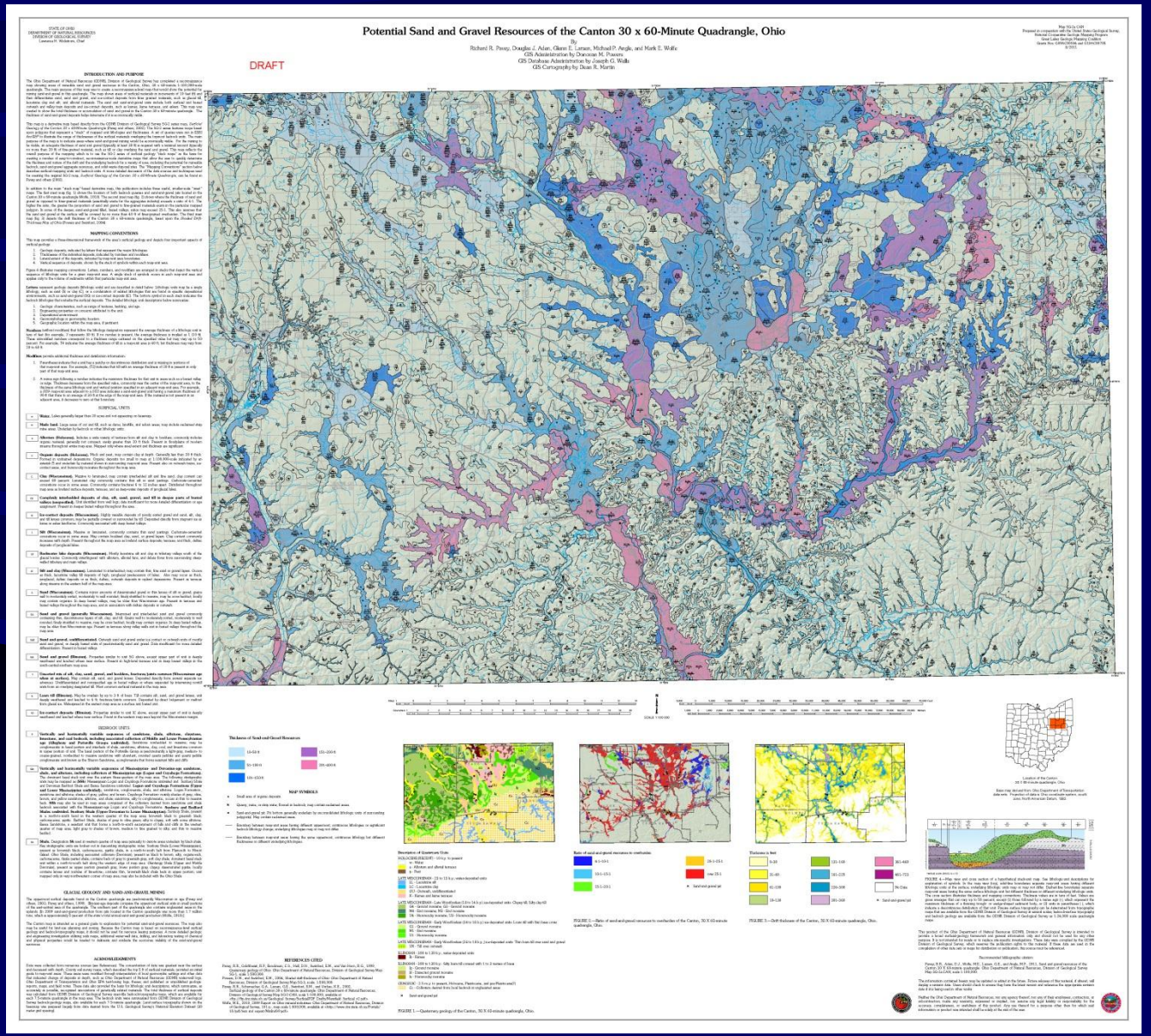
Thickness in Feet

0 – 30	10 – 130	226 – 300	461 – 723
31 – 60	131 – 160	301 – 360	× Pit
61 – 100	161 – 225	361 – 460	⚒ Quarry
No Data			

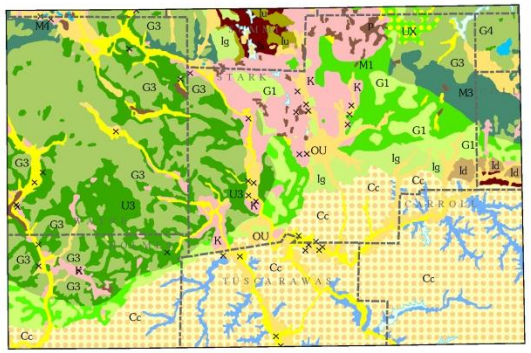
FIGURE 3.—Drift thickness of the Findlay, Ohio, 30 X 60 minute quadrangle.



Derivative Map-Potential Sand & Gravel Resources of the Canton 30 x 60 Minute Quadrangle



Inset maps for the sand & gravel resources-includes the Quaternary geomorphic map, a thickness of fine drift (overburden) and a drift thickness map



Description of Quaternary Units

HOLOCENE (RECENT) - 10 k.y. to present
- w - Water
- a - Alluvium and alluvial terraces
- p - Peat

LATE WISCONSINAN - 23 to 13 k.y.; water-deposited units
- LL - Lacustrine silt
- LC - Lacustrine clay
- OU - Outwash, undifferentiated
- K - Kames and kame terraces

LATE WISCONSINAN - Late Woodfordian (18 to 14 k.y.) ice-deposited units: Clayey till; Silty clay till
- G4 - Ground moraine; G3 - Ground moraine
- M4 - End moraine; M3 - End moraine
- U4 - Hummocky moraine; U3 - Hummocky moraine

LATE WISCONSINAN - Early Woodfordian (24 to 18 k.y.) ice-deposited units: Loam till with thin loess cover
- G1 - Ground moraine
- M1 - End moraine
- U1 - Hummocky moraine

LATE WISCONSINAN - Early Woodfordian (24 to 18 k.y.,) ice-deposited units: Thin loam till over sand and gravel
- UX - Till over outwash

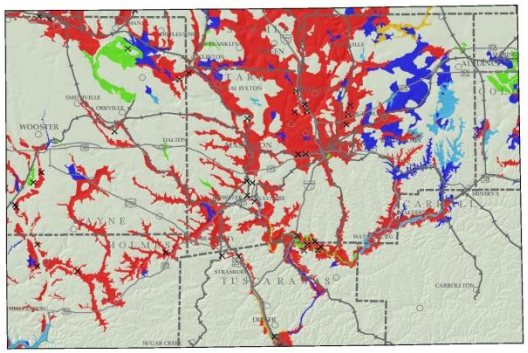
ILLINOIAN - 300 to 130 k.y.; water-deposited units
- Ik - Kames

ILLINOIAN - 300 to 130 k.y.: Silty loam till covered with 1 to 3 meters of loess
- Ig - Ground moraine
- Id - Dissected ground moraine
- Iu - Hummocky moraine

CENOZOIC - 2.5 m.y. to present, Holocene, Pleistocene, and pre-Pleistocene(?)
- Cc - Colluvium derived from local bedrock in unglaciated areas

× Sand-and-gravel pit

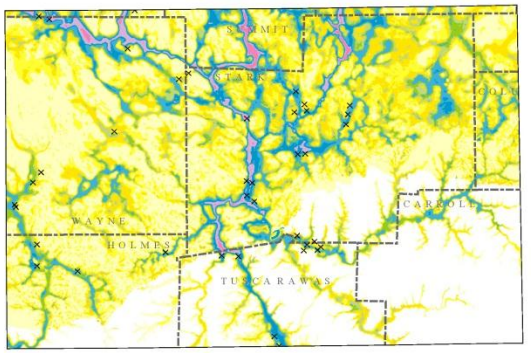
FIGURE 1.—Quaternary geology of the Canton, 30 X 60-minute quadrangle, Ohio.



Ratio of sand-and-gravel resources to overburden

- 4:1–10:1
- 10:1–15:1
- 15:1–20:1
- 20:1–25:1
- over 25:1
- × Sand-and-gravel pit

FIGURE 2.—Ratio of sand-and-gravel resources to overburden of the Canton, 30 X 60-minute quadrangle, Ohio.



Thickness in feet

- 0–30
- 31–60
- 61–100
- 10–130
- 131–160
- 161–225
- 226–300
- 301–360
- 361–460
- 461–723
- No Data
- × Sand-and-gravel pit

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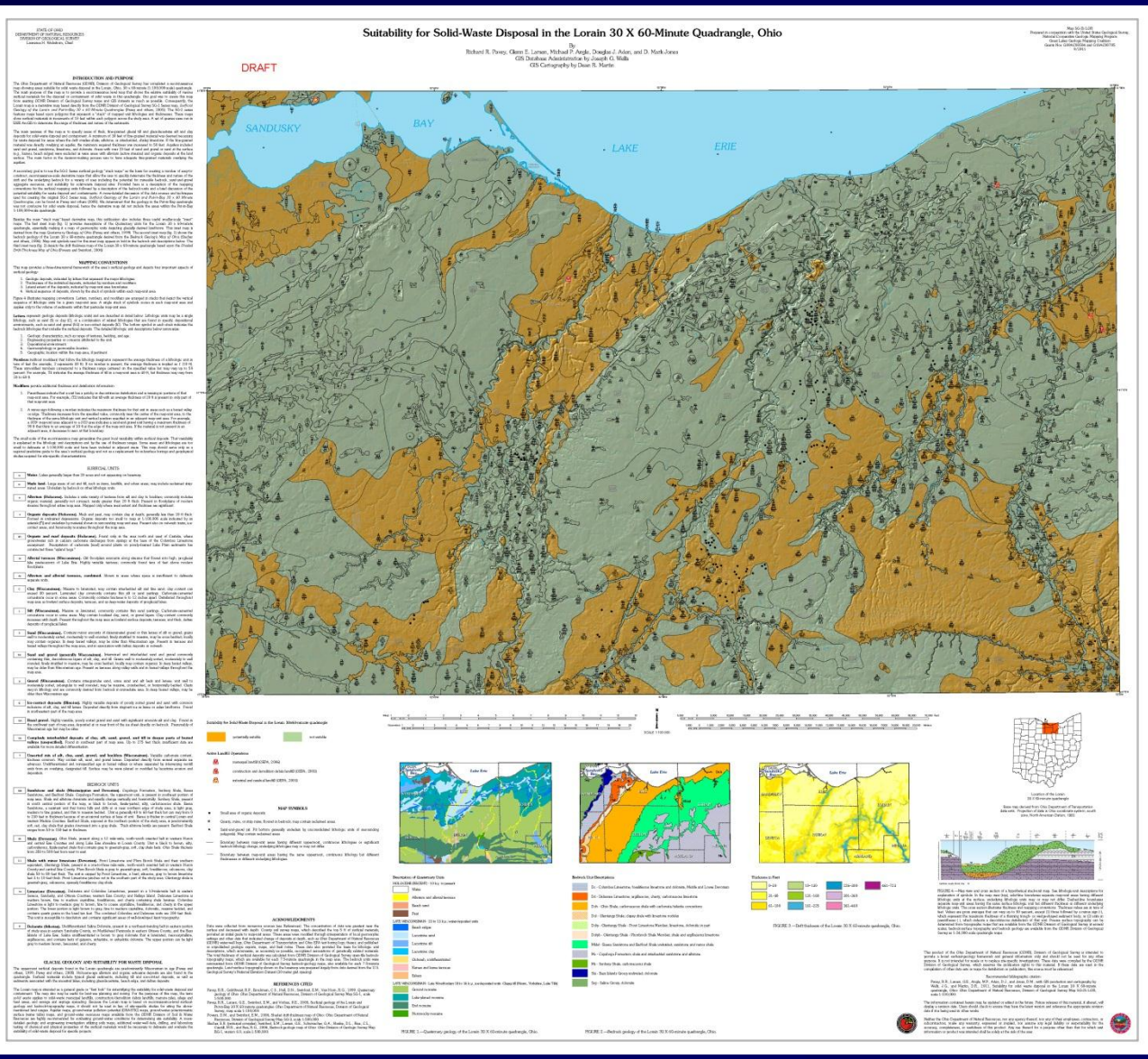
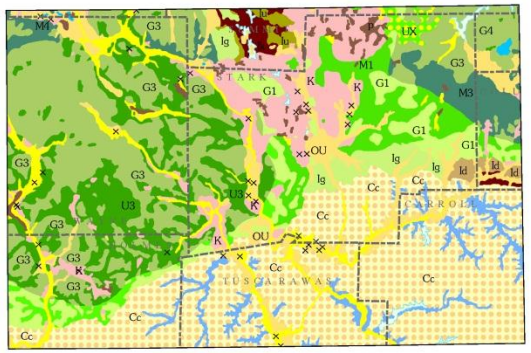
Derivative Map-Suitability for Solid- Waste Disposal in the Lorain 30 x 60 Minute Quadrangle



Inset maps for the Suitability for waste disposal. These include Quaternary (geomorphic) geology, Bedrock type , and drift thickness



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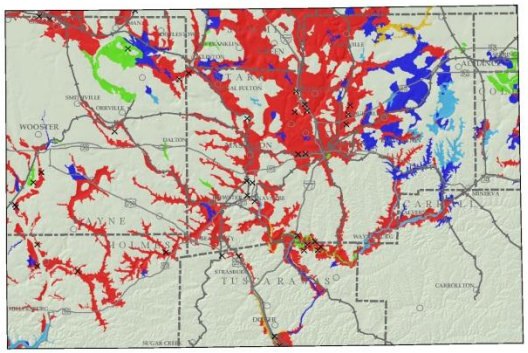

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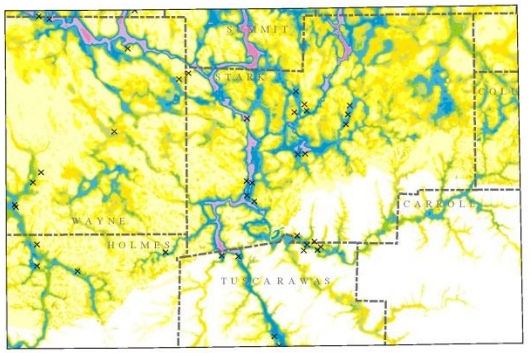

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Future ideas

- Geohazards-perhaps karst overlain on surficial geology
- Geohazards-slope stability, rock-fall, landslide potential for SE Ohio
- Suitability for well pad construction (Utica play-eastern Ohio)

QUESTIONS ?

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