

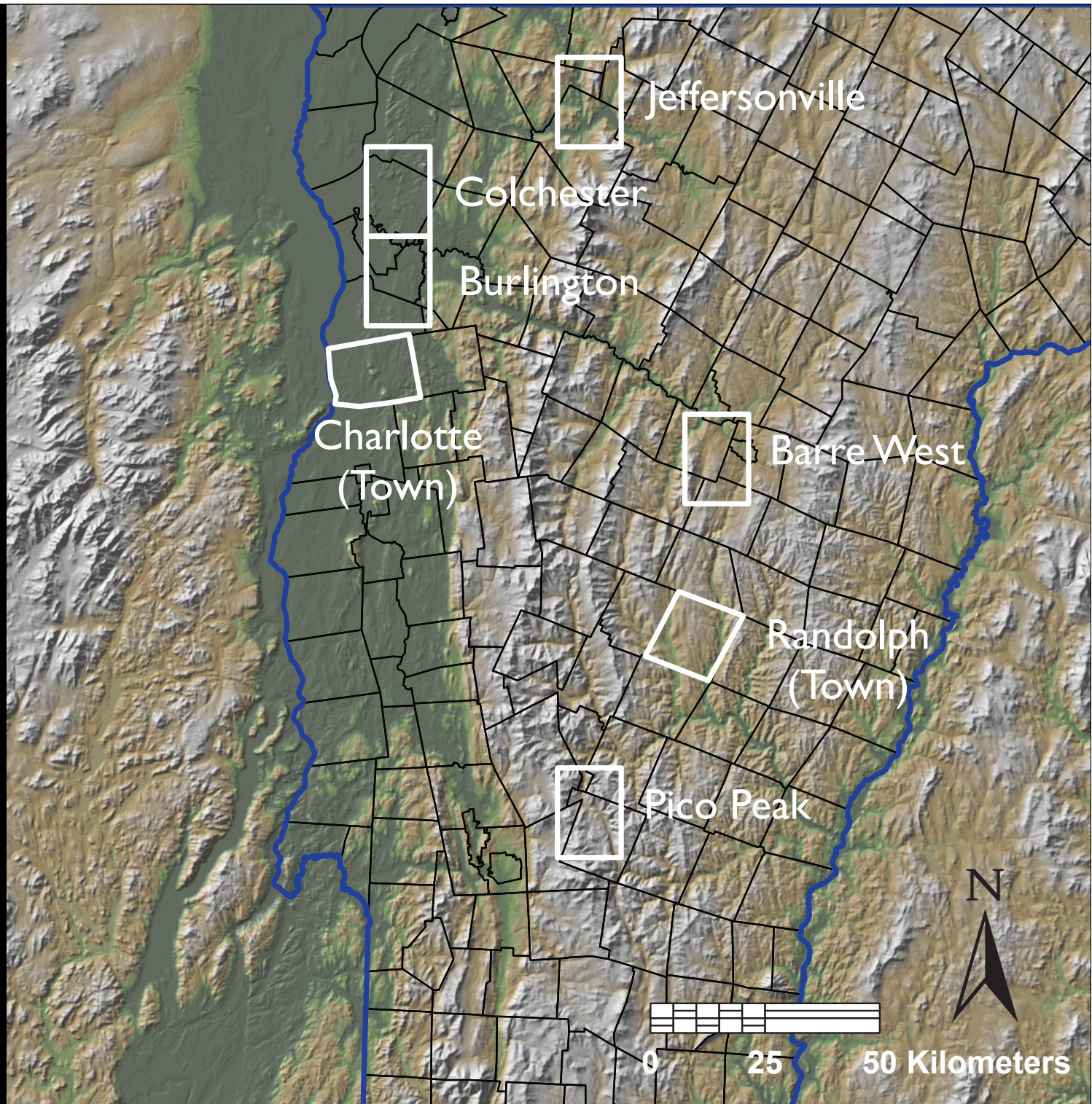


Surficial Geology and Land Use in Vermont

Stephen Wright
Department of Geology
University of Vermont

Channel eroded into fine Glacial Lake Hitchcock sediments,
North Randolph, Vermont

Surficial
mapping
projects
undertaken
under the
auspices of the
Vermont
Geological
Survey



Fred Larsen's generalized fining- upwards stratigraphic section for glacial deposits in the river valleys of central Vermont

Larsen, 1987

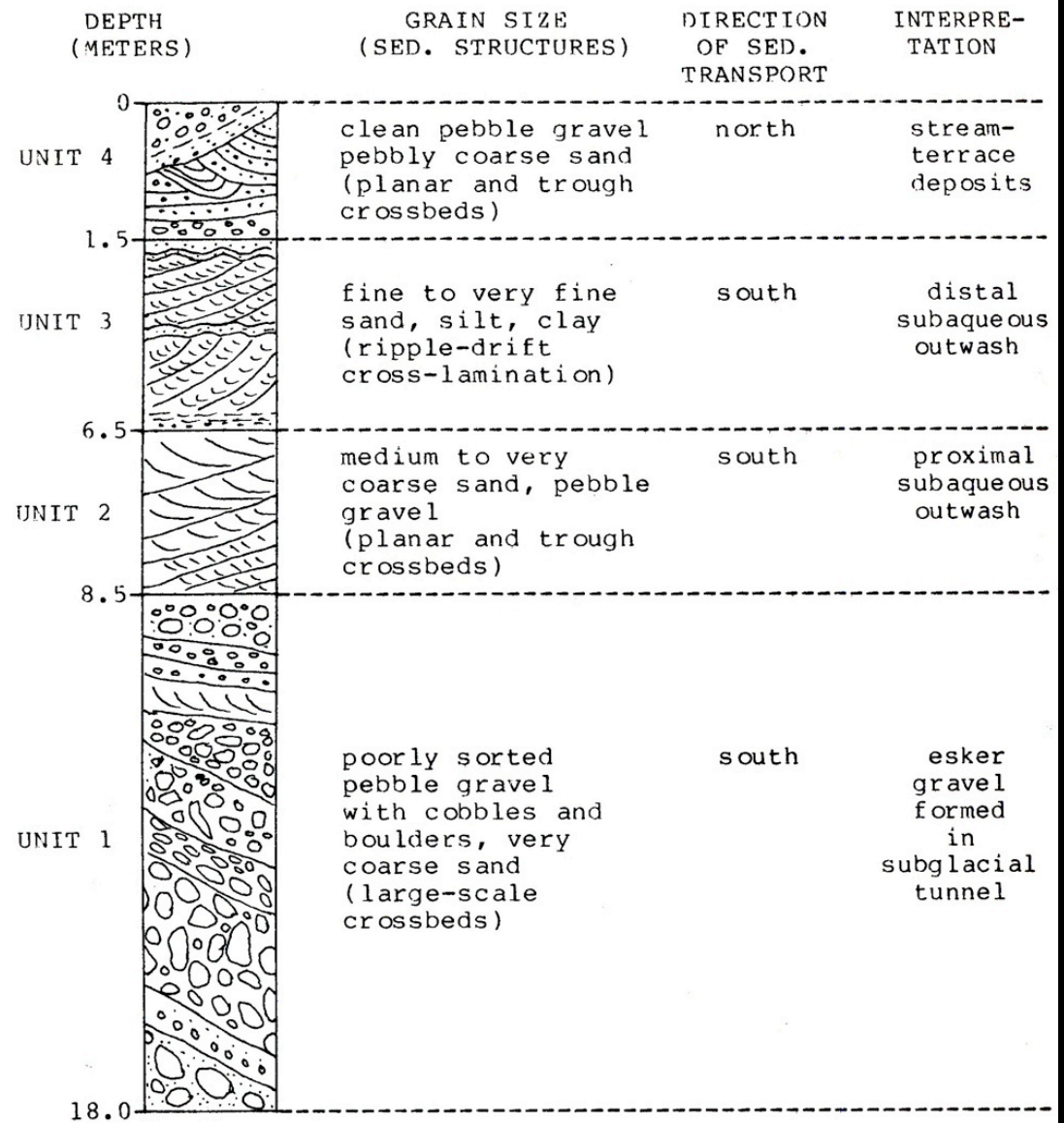
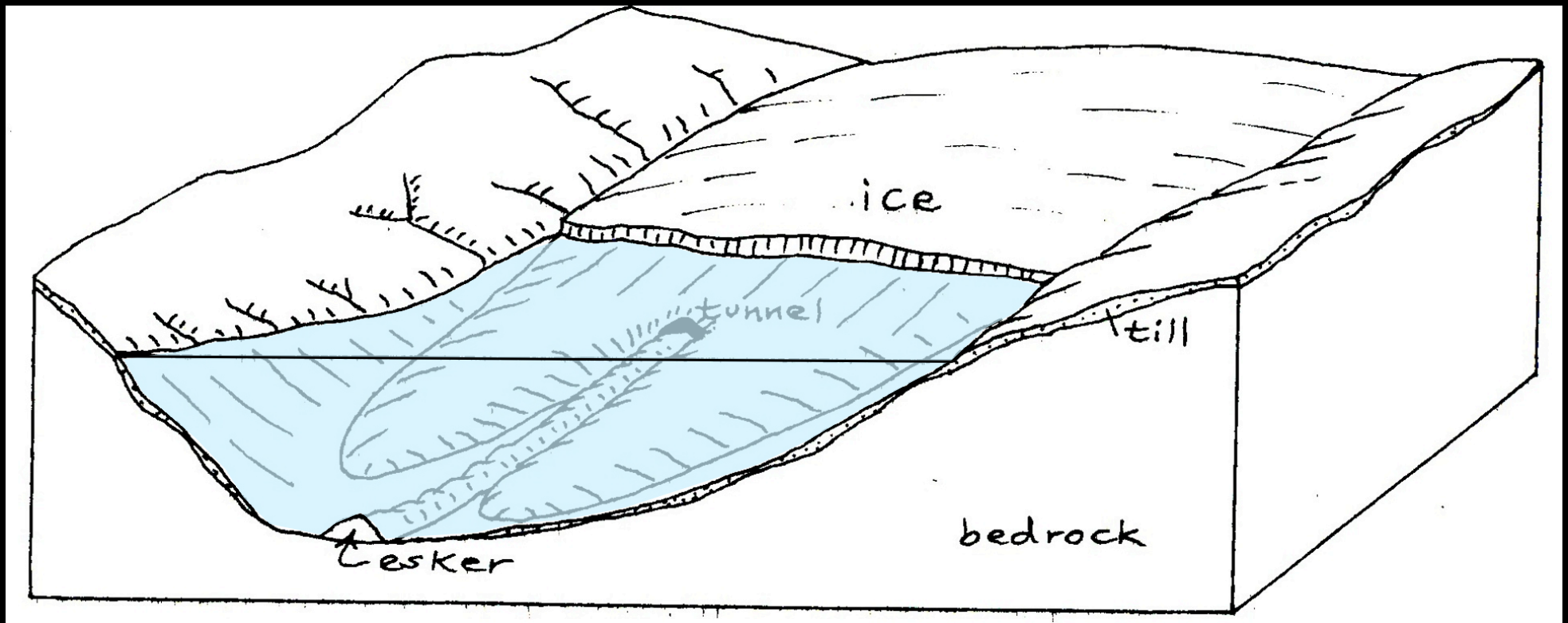


Figure 8. Generalized stratigraphic section for gravel pits in the Dog River valley. Units 1, 2 and 3 constitute a fining-upward sequence produced by northward retreat of an ice margin in a lake. Sediment is delivered to the lake floor by south-flowing turbidity currents issuing from a subglacial tunnel. Unit 4 was formed after the lake drained (Compare with Rust and Romanelli, 1975; depth scale is not linear).

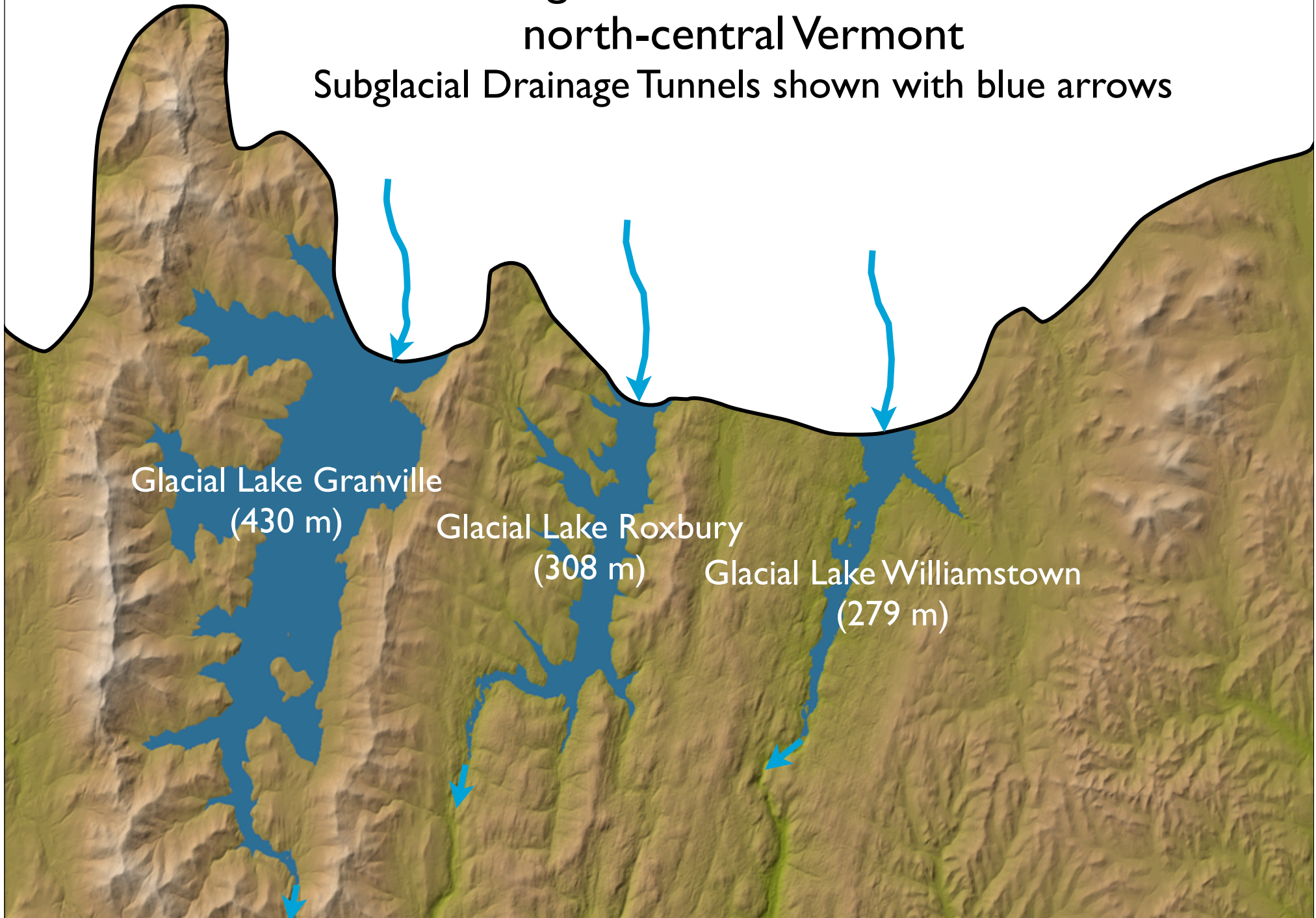
Fred Larsen's model for ice retreat down northward-draining valleys



Larsen, 1987

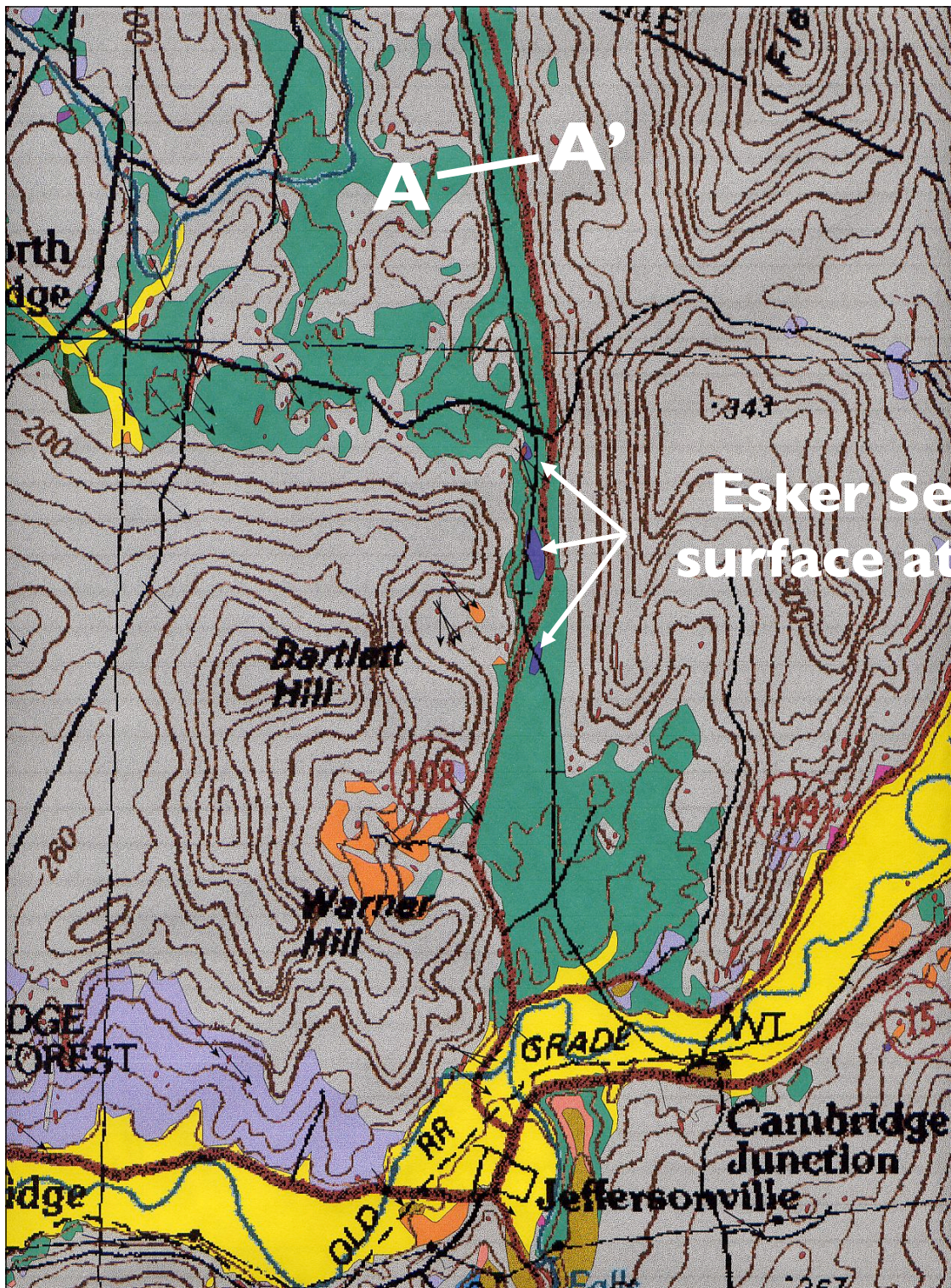
Retreating Laurentide Ice Sheet across north-central Vermont

Subglacial Drainage Tunnels shown with blue arrows



Jeffersonville Quadrangle

**Esker Sediments exposed at the
surface at bedrock drainage divide**



North Cambridge Cross-section (1)

West

East

- 700

600

500

400

300

200 ft asl

Varved silt/clay

Bedrock with thin
till cover

Bedrock with thin
till cover

Well 94

vc

fs/vfs

ms/cs

gravel

A

A'

vc varved silt/clay
vfs very fine sand
fs fine sand
ms medium sand
cs coarse sand
g gravel

0 500 1000 ft

Vertical Exaggeration: 2.5X

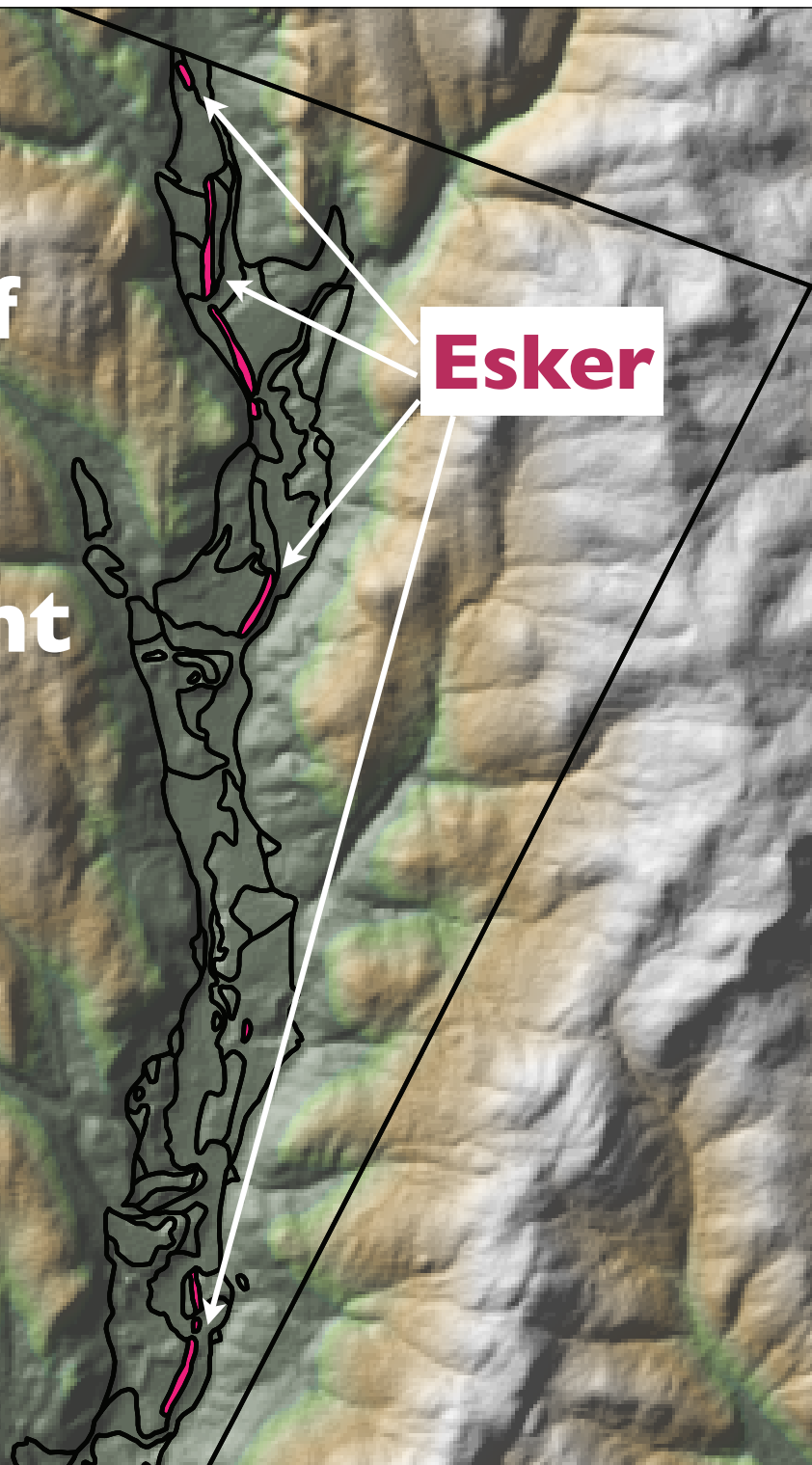


Second Branch of the White River Valley Esker Randolph, Vermont



0 1 2 Kilometers

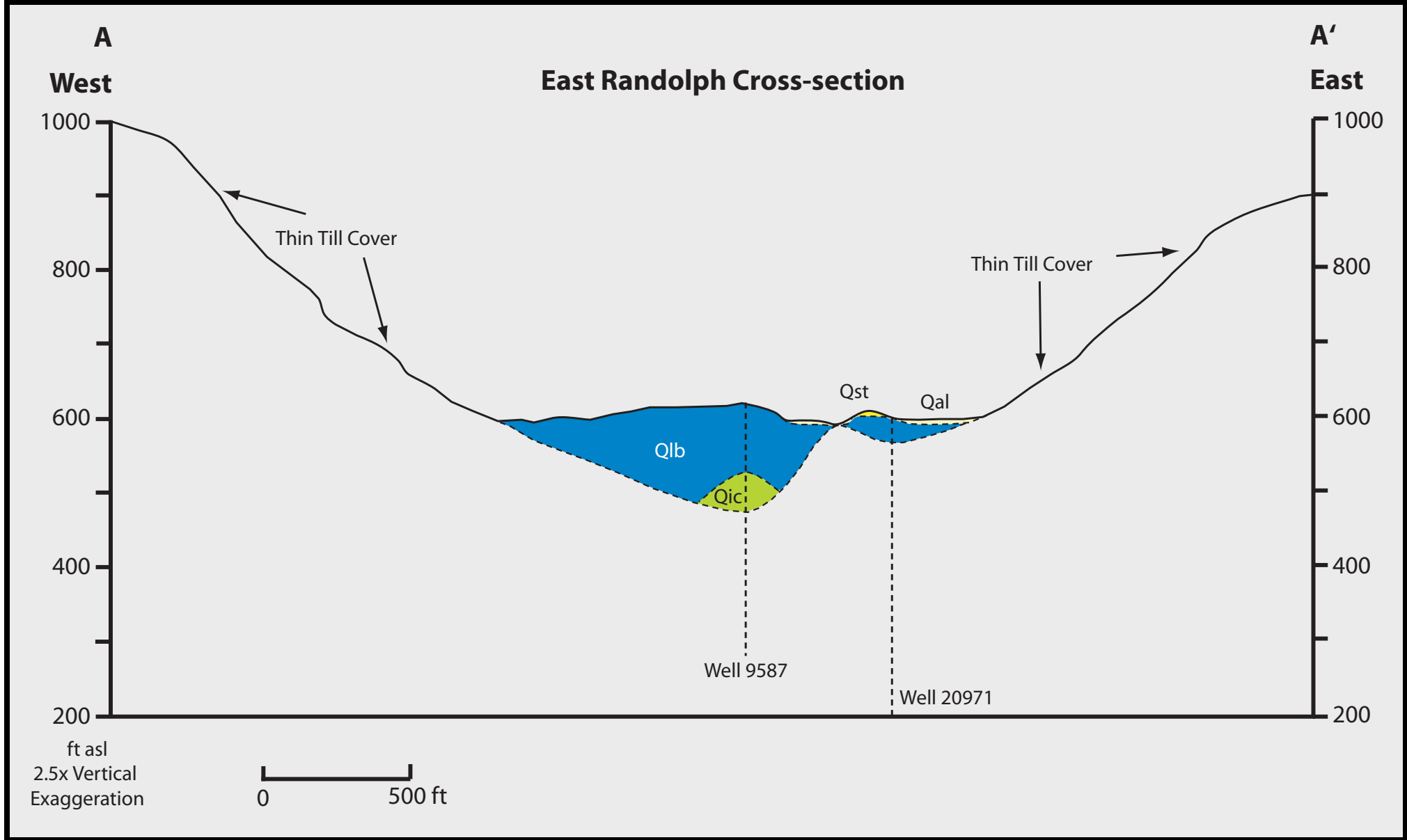
Esker



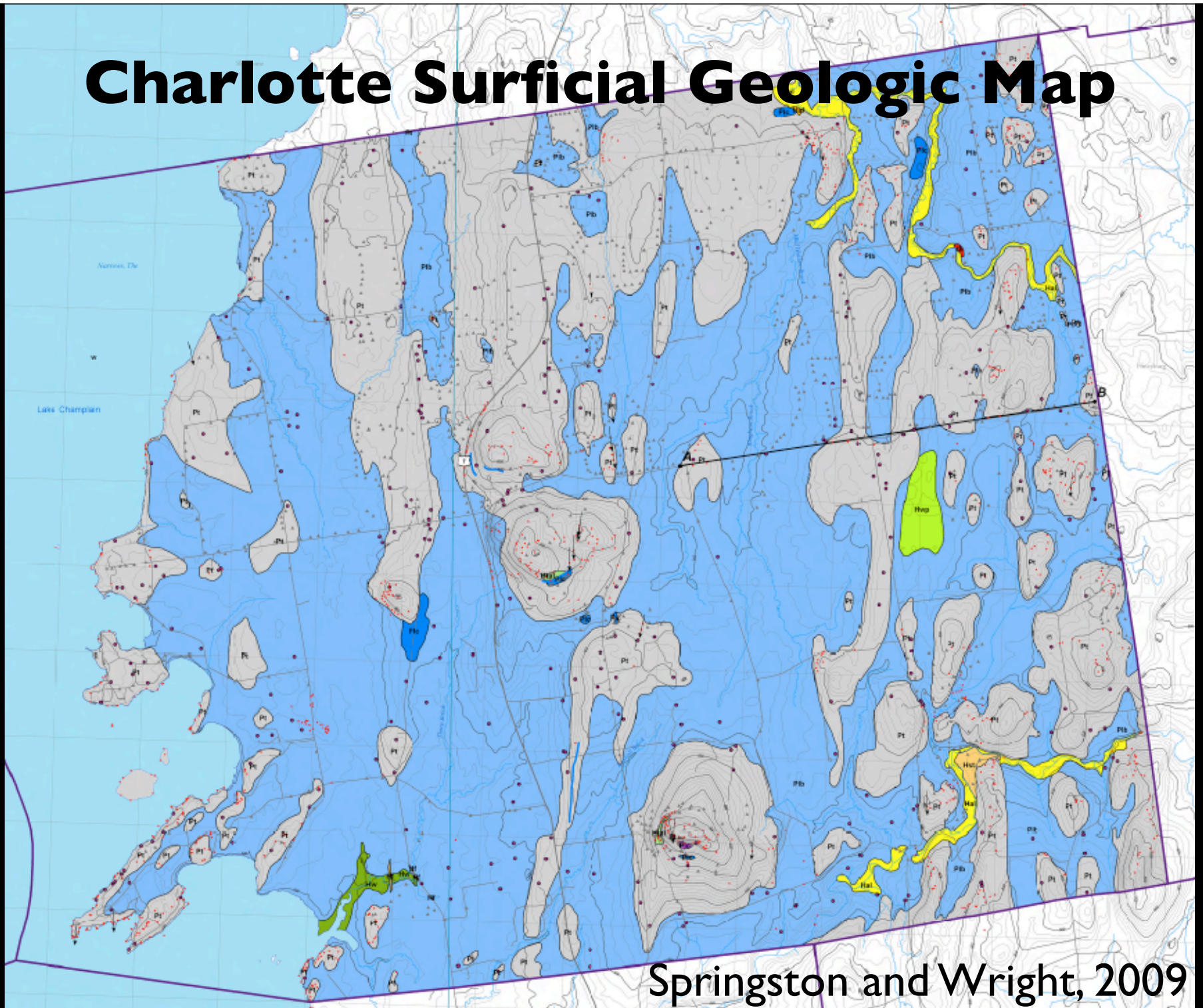
Top of esker overlain by fine lacustrine sand/silt
East Randolph



Esker and Ice-proximal subaqueous fan sediments (Q_{ic}) are overlain and confined by Lake Bottom sediments (Q_{lb}).



Charlotte Surficial Geologic Map



Springston and Wright, 2009



Mound septic systems are extensively utilized in Charlotte where silt/clay-rich till, lake-bottom sediments, and marine sediments cover most of the town.

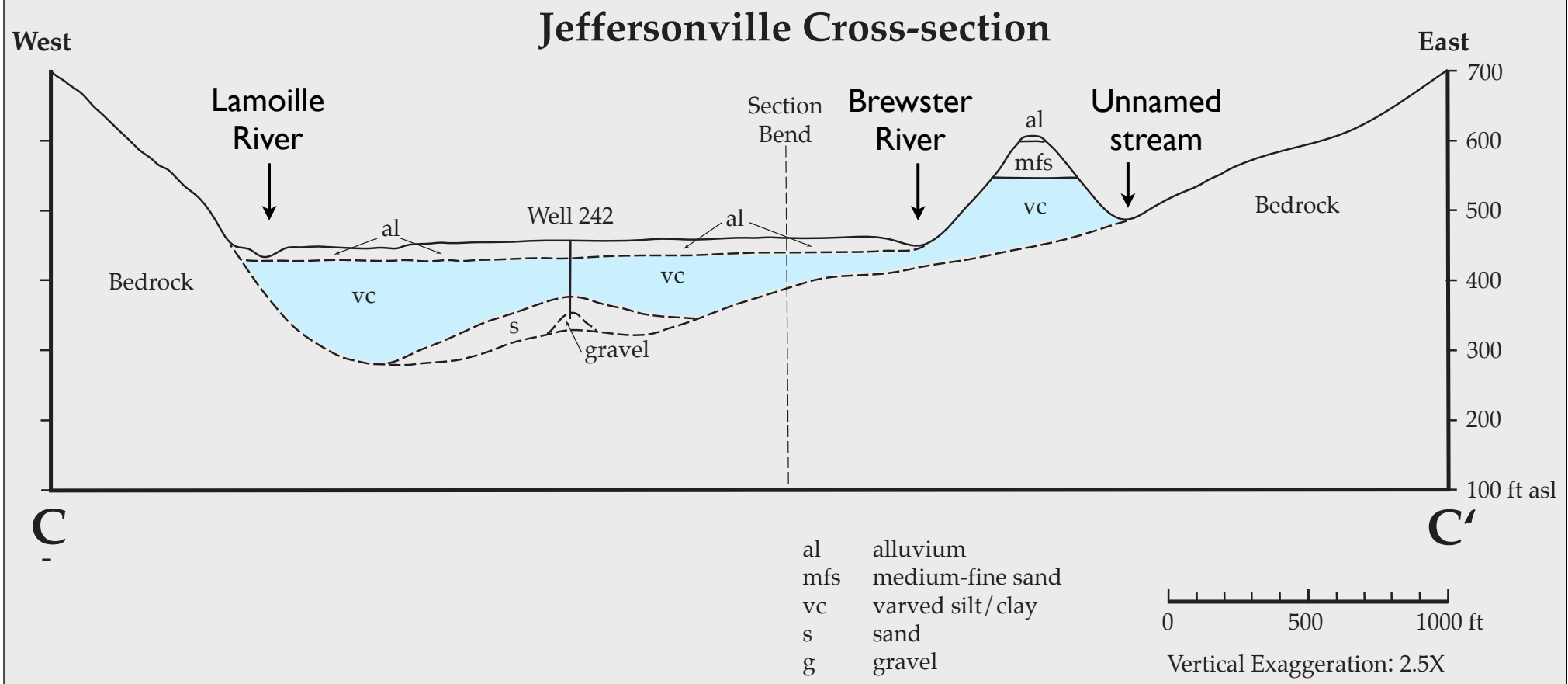


An aerial photograph showing a residential area at the top with several large, multi-story houses. Below the houses, a river flows through a landscape heavily littered with debris from landslides. The debris includes large logs, branches, and chunks of earth and rock. The river itself is turbulent, with white water rapids. The surrounding vegetation is sparse, with many bare trees and some evergreens. The overall scene depicts the aftermath of a major geological event.

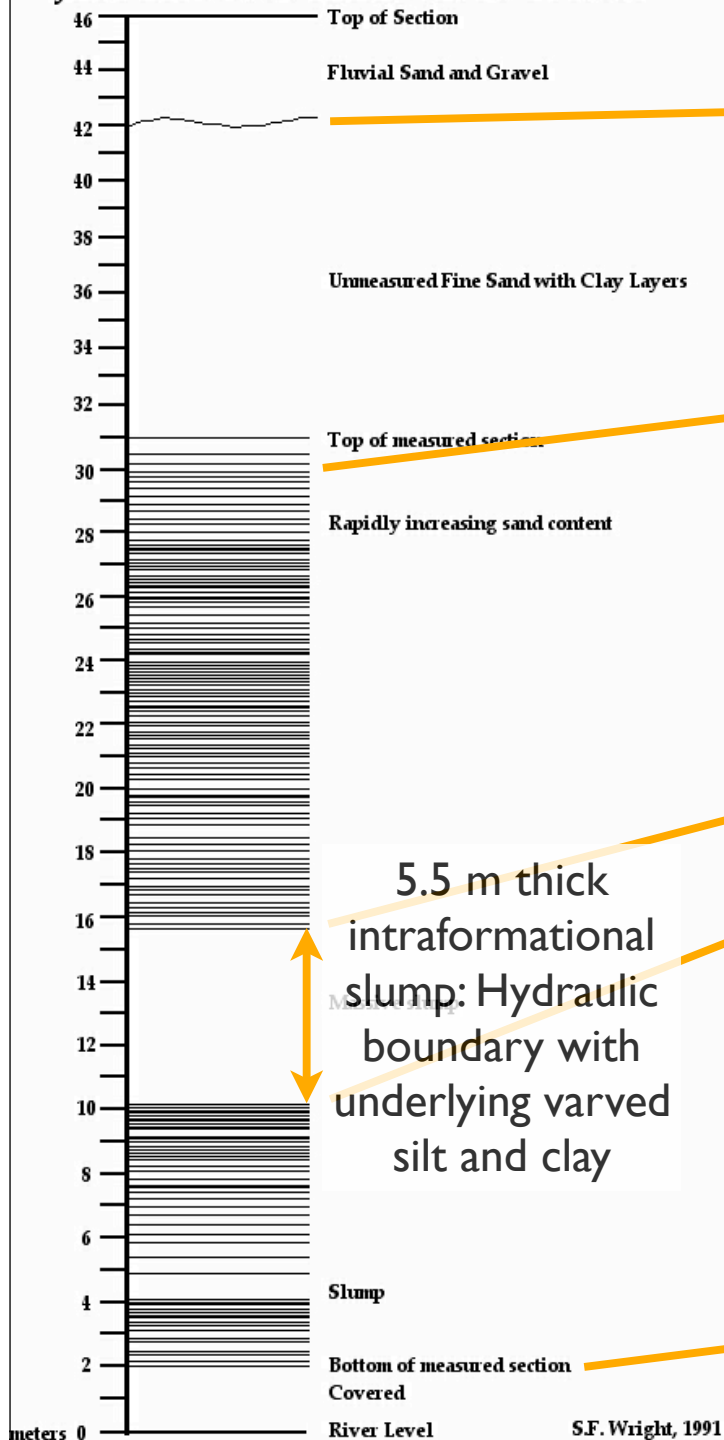
Cambridge (town) school

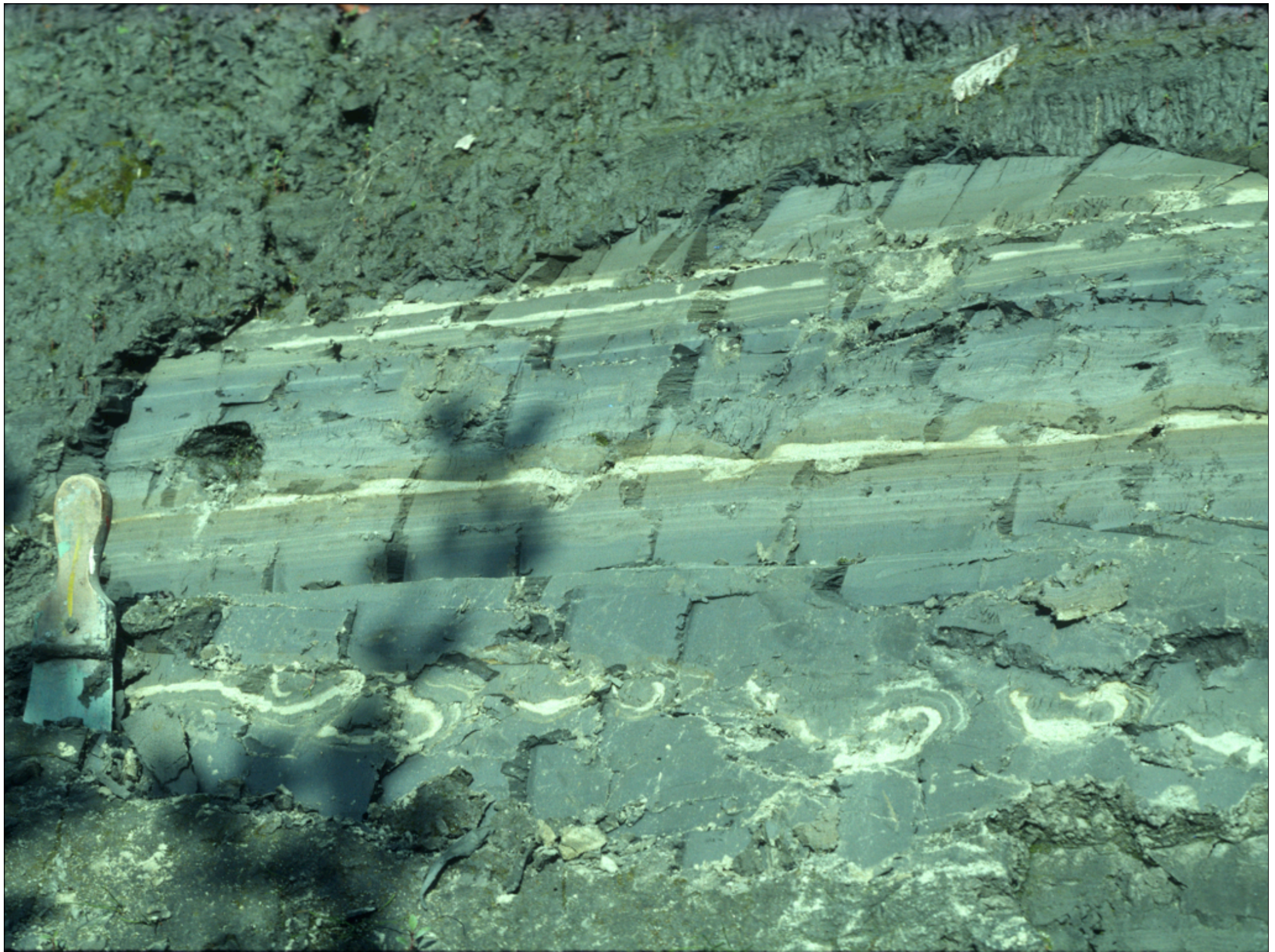
Runout from the 1999 Jeffersonville (village) landslides

Brewster River



JEFFERSONVILLE CLAY BANK





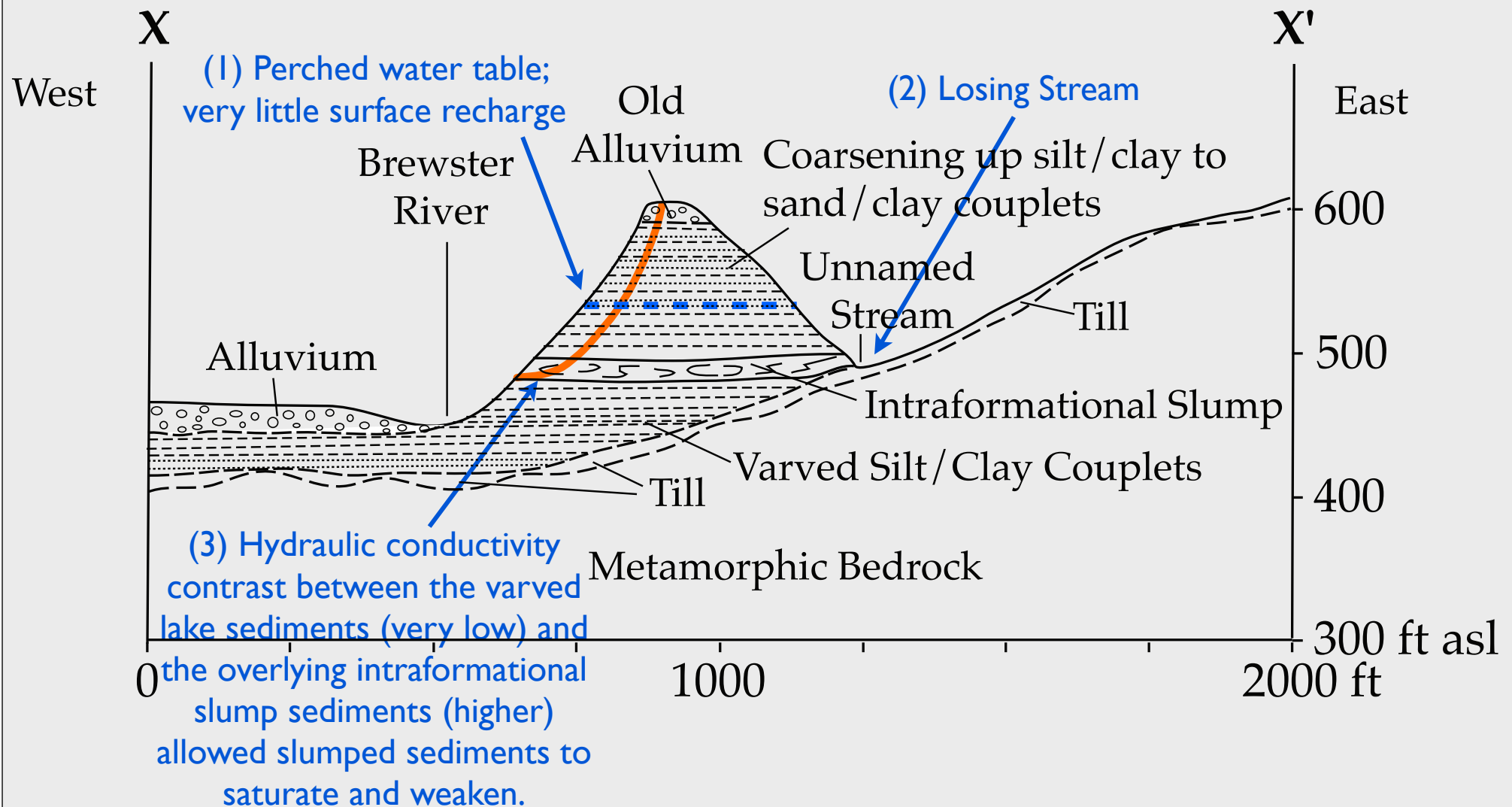


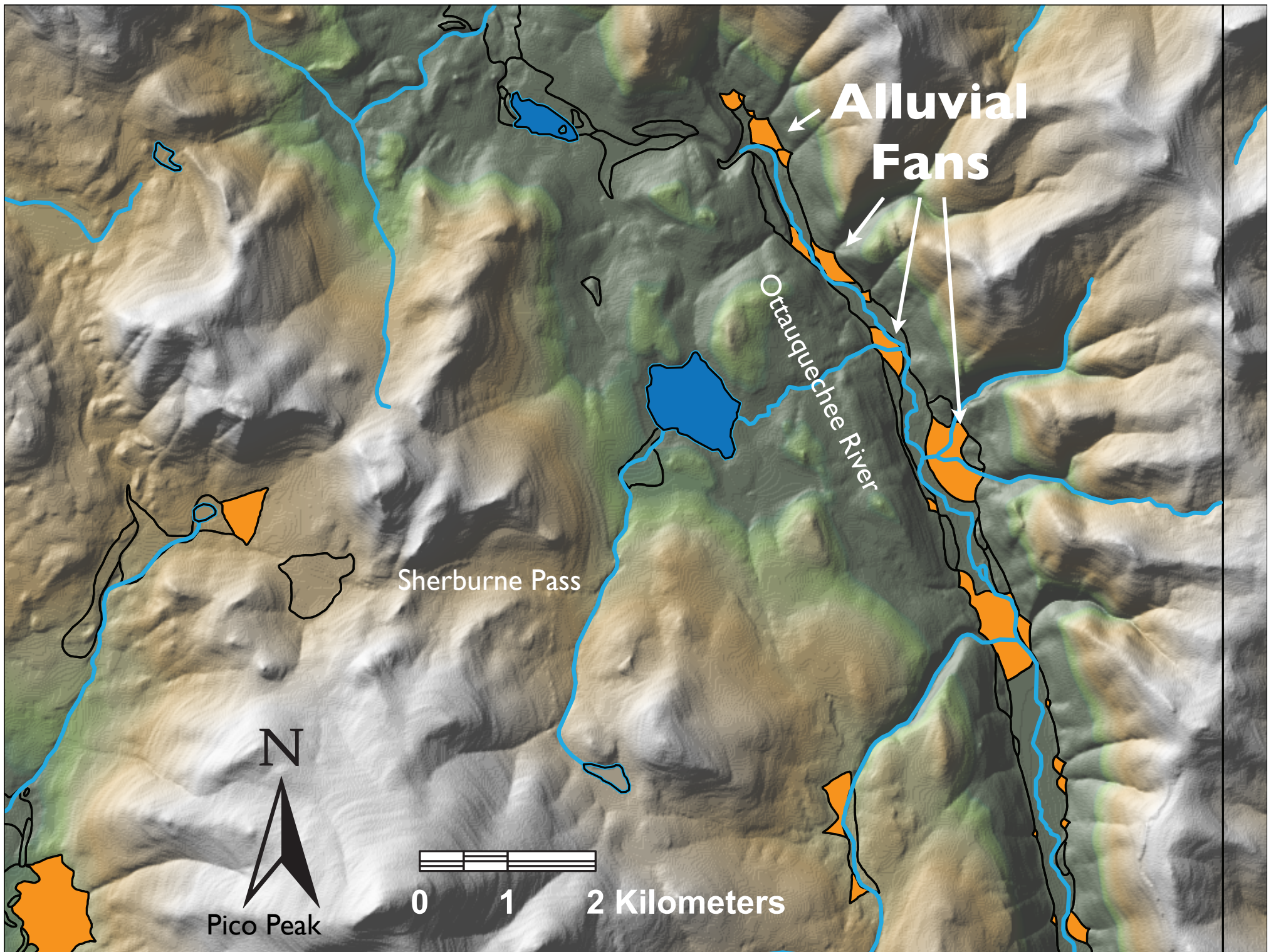


Failure plane (base of the rotational slide) occurred within the intraformational slump layer, ~10 m above river level.



Hydrologic setting of the Jeffersonville Landslides







Alluvial Fans in the Ottauquechee River Valley

- Guide the path of the Ottauquechee River
- Valley is largely filled with outwash sand and gravel
- Water table is very close to the surface
- Alluvial fans provide the largest areas of well-drained soils for historical development in the valley.
- Many of the streams feeding these fans deposited new aprons of sediment during Tropical Storm Irene.

AT Boardwalk was
largely destroyed during
Tropical Storm Irene

Till

Alluvium

Alluvial Fan

Kent Brook

Till

Appalachian
Trail Boardwalk





Sherburne
Village

Brimstone Brook

Village of
Sherburne built on
these alluvial fans.

Oval encircles area
damaged by
erosion and new
sediment
deposition during
Tropical Storm
Irene.

An aerial photograph of a rural area in Vermont, overlaid with a map showing geological features. A large, irregularly shaped area in the center is outlined in black and filled with a light brown color, representing a glacial fan. This fan is divided into two sections by a line. The upper section is labeled 'Alluvium' and contains the 'Town Office' and 'Recreation Facilities'. The lower section is labeled 'Ice-contact gravel' and contains the 'Library'. To the right of the fan, a narrow, winding stream is labeled 'Taylor Brook'. To the top right, a larger stream is labeled 'Quimby Brook'. The surrounding area is mostly green, indicating forested land. A large text block in the bottom left corner explains that several key municipal buildings are built on these two coalescing fans.

Town
Office

Quimby Brook

Alluvium

Recreation
Facilities

Ice-contact
gravel

Library

Taylor
Brook

Several key Sherburne
(Killington) municipal
buildings build on these
two coalescing fans

Acknowledgements

- Larry Becker & Marjie Gale: Vermont Geological Survey
- Fred Larsen, George Springston, Rick Dunn
- UVM Students
- Megan McGee, Andy Bosley, Matt Guerino (Jeffersonville Quad)
- Seth Jones, Sarah Fuller, Simon Rupard, Andrew McKinney (Burlington & Colchester Quads)

