

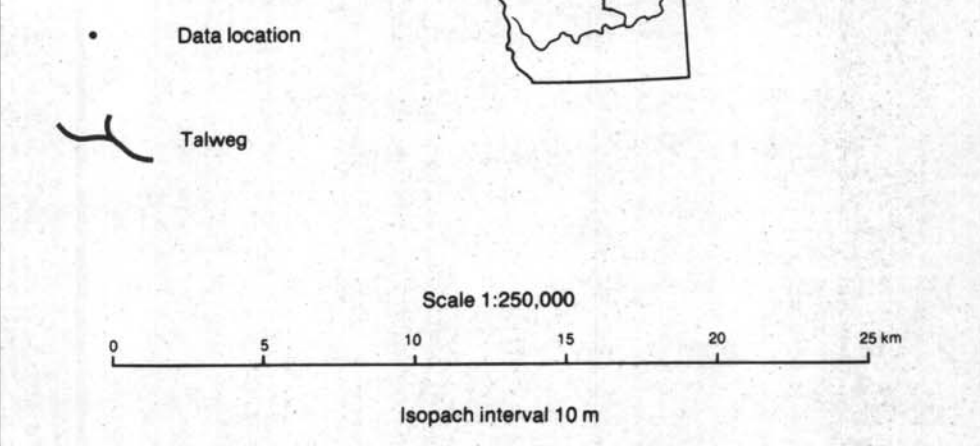
Bedrock Topography, Buried Valleys and Drift Thickness
 The bedrock topography and drift thickness maps were generated using data from various sources. These include Alberta Research Council dry-auger drill data from geological surveys, Alberta Environment groundwater investigation well logs, water-well drillers' electric and litholog descriptions, and oil exploration structure testholes. Information and concepts were derived from previous Alberta Research Council geological, hydrogeological and bedrock topography studies, completed for portions of the area by Carlson (1966), Bibby (1974), McPherson and Kathol (1973, 1975) and Stein (1976, and unpublished data). Carlson's (1966) study presents a detailed report of the bedrock topography and valleys in the Edmonton vicinity.

Borehole data for this project was collected from dry-auger drill surveys conducted between 1978 and 1981. These data include outcrop descriptions, borehole litholog descriptions of the surface materials down to bedrock, as well as laboratory analyses performed for samples of the till units. Requests for these data should be directed to the Terrain Sciences Department of the Natural Resources Division of the Alberta Research Council.

In excess of two thousand drift data points were evaluated and coded in a computerized file. Initial bedrock topography and drift isopach maps were made using SURFACE II computer graphics software at the Alberta Research Council. These preliminary contour maps were then evaluated and manually edited or altered to correspond with known, or assumed, trends in the bedrock topography and drift thickness.

The bedrock topography of the Edmonton area can be described as a regional northeast sloping bedrock surface dissected by numerous channels of preglacial and glacial fluvial origin. The bedrock surface ranges in elevation from about 900 m in the extreme southwest corner of the map area, to as low as 560 m within the buried Beverly Valley in the northeast corner. Major preglacial valleys in the map area are the Beverly Valley, Onoway Valley, and the Vegreville Valley. From southwest to northeast, the major tributaries of the Beverly Valley include the Stony Valley and its tributaries (Calmor, Devon, and New Sarepta valleys), the Boag Valley, the Ardrossan Valley, the Simmons Valley, and the Lamont Valley. The Sturgeon Valley is the only tributary of the Onoway Valley in the map area. From west to east, the tributaries of the Vegreville Valley include the Minsitk, Tawavik, Beaverhill, Holden valleys, as well as the Whitford Valley which likely joins the Vegreville Valley in the Vermilion map area to the east. A number of poorly defined valleys in the south part of the map area are tributaries of the preglacial Red Deer River valley that lies south of the Edmonton map area. These include the Dusty, Camrose, and Bittern valleys.

Drift thickness in the Edmonton map area ranges from less than 10 m over flat-lying bedrock surfaces, to more than 70 m within the Cooking Lake Moraine and a number of buried valleys. Extensive areas of thin drift are found in much of the east third of the map area, as well as within the northwest corner. Thin drift is also found in the southwest part of the map area where Glacial Lake Edmonton drained and eroded some of the existing drift cover. Extensive areas of thick drift (>50 m) are found as infill of major preglacial valleys, particularly the Beverly, Onoway and Stony valleys and headwaters of the Vegreville and Whitford valleys. Stratified drift in excess of 80 m thickness is also present along the flanks of the buried Sturgeon Valley. Thick drift, mainly till, is found within the Cooking Lake Moraine where glacial thrusting eroded Cretaceous sediment along the contact of the Horseshoe Canyon and Bearpaw/Belly River formations. Glacial thrusting and deposition of material from the Vegreville Valley beneath Beaverhill Lake, likely accounts for the thick drift sequence located southwest of the lake in Tp 50, Rg 20.



Drift Thickness of the Edmonton Map Area

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Base maps provided by the Surveys and Mapping Branch, Alberta Transportation, Edmonton
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