

3. PHYSIOGRAPHY

3.1 Drainage Areas in General

Two physiographic regions may be delineated in Labrador: (a) South of and including the Kanairiktok River basin, and (b) North of the Kanairiktok River basin (Shawinigan 1968).

In the southern region, the topography favoured the development of medium to large river drainage basins (of the order of 4,000 km² and up to 95,000 km² for the Churchill River) although smaller basins are spread all along the seacoast. The area is heavily wooded and the rivers have significant volumes of natural storage in lakes and marshes.

Because of the short distance between the main divide of the northern region of Labrador and the seacoast, the rivers in the region have average to small drainage basins (the largest, Adlatok River, is 12,000 km² in area). The area is covered with patches of lichen, forests, bogs (to the south), barren, lakes, and glaciers. The natural storage is smaller than in the southern region.

The river drainage system in Labrador is generally immature, due to the relatively recent uplift of the land surface and the effects of glaciation, but some of the rivers flow

through deeply incised gorges which have developed as the land surface has tilted, resulting in the drainage flowing in the opposite direction to the general tilt of the land surface in parts of the courses of some rivers.

The central interior of Labrador is termed the Labrador Lake Plateau, which is an area where glacial activity during the Pleistocene age has interfered with the drainage leaving a large concentration of lakes and swamps. More than 28,000 km² of the surface at the interior plateau is occupied by lakes.

3.2 Database

Physiographic data for gauged watersheds is lacking. There have been no detailed and systematic abstractions of physiographic parameters for gauged watersheds in Labrador. The available data is shown in Table 3.1. The latitude and longitude of the watershed centroids were calculated for this study from a trace of the watershed boundaries on a 1 : 2,000,000 scale map. The estimated accuracy is 0.05 degrees. Hydrological parameters will be plotted on a map near the watershed centroids. Outlet control is a subjective evaluation of whether there is a large lake at the outlet of the watershed which attenuates peak flows. This evaluation was made from the same 1 : 2,000,000 scale map. This parameter is expected to have a significant effect on peak flows. Among the physiographic parameters which may be useful for predicting hydrological variables are:

**Table 3.1 Physiographic Parameters for Naturally Flowing
Gauged Watersheds in Labrador**

Station Number	Station Latitude ¹ . (degrees N)	Station Longitude ¹ . (degrees W)	Centroid Latitude ² . (degrees N)	Centroid Longitude ² . (degrees W)	Drainage Area (km ²)	Outlet Control? ³ .
02XA003	52.2283	61.3225	52.60	62.30	4,540	No
02XA004	52.1639	60.0594	52.40	60.00	2,060	No
02XD002	51.7575	56.4514	51.80	56.45	35.5	Unknown
03NF001	55.2333	61.2992	55.20	62.30	7,570	No
03NG001	54.6236	60.9772	54.70	62.70	8,930	Yes
03OA003	54.0978	66.5589	54.25	67.20	3,610	No
03OA004	53.2278	66.2067	52.80	66.35	8,310	Yes
03OB002	53.7450	64.6400	53.45	65.80	33,900	Yes
03OB003	54.5472	65.5522	54.70	65.80	1,040	Yes
03OC002	53.8264	65.2936	52.90	65.15	19,900	Yes
03OC003	52.9675	64.6611	52.80	64.95	15,100	Yes
03OC004	52.6528	64.8475	52.80	65.40	7,070	Yes
03OC005	52.2872	64.3278	51.95	64.80	3,680	Unknown
03OD001	53.4433	63.6867	Unknown	Unknown	57,500	Unknown
03OD003A ⁴ .	53.4467	64.7600	52.85	65.15	19,900	Yes
03OD004	53.4233	63.2333	Unknown	Unknown	1,090	Unknown
03OE001A ⁴ .	53.2478	60.7892	53.40	64.90	78,800	No
03OE002	52.6158	61.1817	52.55	61.70	2,220	Yes
03OE003	52.6147	61.1864	52.55	61.75	2,330	Yes
03PB001	54.1156	63.2250	54.20	64.00	8,990	Yes
03PB002	54.1317	61.4292	54.30	62.15	4,480	Yes
03QC001	53.5342	57.4950	53.10	58.75	10,900	No
03QC002	52.6492	56.8714	52.55	57.20	2,310	No

1. Station latitude and longitude to nearest second

2. Centroid latitude and longitude to nearest 0.05 degrees

3. Outlet control is a subjective evaluation of whether there is a large lake at the outlet of the watershed which attenuates peak flows

4. Streamflow records split into two parts: a natural flow record and a regulated flow record

percentage of watershed controlled by lakes and wetlands, slope of main channel, percentages of land cover types (lakes, wetlands, forest and barren), drainage density, basin aspect, watershed slope, length of main channel, and basin altitude range. The abstraction of these parameters on a watershed basis would require a considerable amount of effort.