Indians say that a large river empties into the lake at the head of this bay. The north-east and north-west bays are not so deep as the southern ones; the distance from the end of the point to the mouth of the Papasqutsatee River, a large stream coming in at the head of the north-west bay, being fifteen miles, with an average breadth of rather more than four miles. From the mouth of the Toquaoeo River, which enters the north-east bay at its head, to the end of the point, the distance is nineteen miles, the average breadth being under four miles. By this river a canoe route goes to a Hudson Bay post, called Nitchicoon, situated on a branch of the East Main River, to the north-east. This stream falls rapidly during the dry season, being an exception to the other rivers running into the lake, which, taking their rise in large lakes, are not generally affected by local rainfall.

Besides those above referred to, the large river flowing out of Lake Temiscamie, and passing through Lake Mistassini, enters the lake on the east side about twenty miles from the head of the north-east bay. Almost directly opposite this river, on the west side, a smaller stream, called the Wabassinon River, enters.

The shore of the lake is indented by a number of smaller bays, and many islands also occur along its margin. The shores are mostly rocky, with no marshes or beach, a fact accounting for the absence of any great number of wading birds or grammaceous ducks. The western bank rises from thirty to sixty feet above the surface of the water, and is in many places perpendicular. The eastern bank is not so elevated, and rises more gradually.

To the south of Mistassini, and running north of east, is a ridge of hills forming an escarpment about 300 feet high, and constituting the Height of Land between the waters flowing to the St. Lawrence and those draining to Hudson Bay, and the present division lines between the Province of Quebec and the North-east Territory. To the north is another range, passing within ten miles of the lake and trending away to the westward. The highest of these hills does not rise more than 500 feet above the level of the lake.

The country in the vicinity of the lake is generally slightly rolling, with rounded hills, rising from thirty to sixty feet above the water, and interspersed with numerous small lakes and marshes.