

Baffin Island, are stable to between 50° and 60° while the South and East Greenland types are initially unstable, that is, they have a negative righting moment at 1° of heel. The contextual difference is that the Canadian Inuit relied on broad stable flat-bottomed kayaks that could carry killed game on the after deck. They also constructed the cockpit coaming to be higher in the front than in back to keep waves out of the kayak. The Greenlanders, however, sealed themselves into their kayaks so they became a single unit, often towed their game, and developed over two dozen roll techniques in case of capsize. These capsizes could be the result of an accident or they might be done on purpose when they wanted to escape the force of a breaking wave. These were two different solutions to the basic problem of hunting and retrieving marine mammals in a seaworthy craft.

Both the Koryak and Aleut hunted sea mammals from very crank craft and neither developed capsize-recovery techniques. They both achieved acceptable stability, however, by carrying rock ballast in the boat to lower the center of gravity. In addition, the Aleut carried water in inflated bladders or skin containers. These could be emptied of water and filled with air and then tucked into the bow and stern to act as a buoyancy bag in case the kayak cover was torn or otherwise holed.

Hunters pursuing sea mammal relied on stealth rather than speed to capture their quarry, unlike the people who hunted caribou crossing inland lakes and rivers. The latter's kayaks had to be long, narrow and almost round-bottomed to achieve maximum speed for successful pursuit of the fast-swimming caribou. This was accomplished at the expense of poor stability. The Caribou Eskimo kayaks are fine examples of this type. The Copper, Netsilik, Pt. Barrow and Nunamiut Eskimo kayaks were also used mainly for this activity.

The Mackenzie Eskimo kayaks are also initially unstable, but they were used more extensively to pursue white whales in a community hunt on the Mackenzie River than to hunt caribou. There are other interesting design features of the Mackenzie kayak that raise questions about the origin of these people and some other uses of their kayaks. Unfortunately, the Mackenzie Eskimo became culturally extinct shortly after 1903 when they were hard hit by European diseases and it is no longer possible to conduct field research on these questions.

A detailed analysis of the data for each different kayak type is beyond the scope of this paper but is being incorporated into a future book on the subject. It would be instructive to tank test a reproduction of each kayak type to determine the residual resistance, a factor that cannot be mathematically computed. It is the resistance of an object moving through the water other than that due to the wetted surface area. It is determined by towing the boat at a given speed and measuring the amount of force necessary to maintain that speed. The frictional resistance is subtracted from the test figure and the remainder is the residual resistance. I have been able to test a reproduction of an east coast Hudson Bay kayak and found that it took 8 pounds (3.6 k) of force to tow it at 5 knots with a load of 150 pounds (68 k) in the cockpit. This compares to 75 pounds (34 k) of force necessary to move a scuba diver at 5 knots. The kayak, almost 22 feet long (670.6 cm), is obviously a very efficient means of water transport. How this resistance figure compares with other kayaks is again beyond the scope of this paper.