2.2.1 The Bona Churchill Ice Cores: field work lab analysis

The Bona Churchill Ice Cores were recovered from the saddle (61^{o} $24^{'}$ N, 141^{o} $42^{'}$W; 4420 meters), separating Mount Churchill (61°25′N, 141°42′W. 4,766 meters) and Mount Bona (61°23′N, 141°44′W. 5,005 meters) between April 30th and June 10th, 2002 by a team of research scientists led by Dr. Lonnie Thompson from the Byrd Polar Research Institute (BPRC) of The Ohio State University (Fig. 2.1). Bona Churchill Core 1 (hereafter referred to as BC1) drilled to bedrock measures 460m in length and is the longest core ever recovered from a mountain glacier. Borehole measurements at 10m and 460m of -23.1° C and -6°C, respectively, indicate that the Bona-Churchill col supports a cold based glacier. The two summits separating the col, Mt. Bona and Churchill, lie in the northern half of the St. Elias Range in southeastern Alaska (Fig. 2.1C). The St. Elias range runs along a northwest-southeast axis approximately 100km from the coast and is characterized by the imposing elevations of its numerous peaks, including St. Elias (5490m) and Mt. Logan (6051m) and one of the world's largest mountain glacier systems.

In total, 623 meters of ice were recovered by the Bona Churchill ice core drilling team. The upper 180 meters of BC1 were drilled with an electro-mechanical drill, and the remainder was drilled using a thermo-alcohol electric drill. Drilling of BC1 ended when repeated attempts were made with different drilling techniques to extend the core without success. Large pebbles and visibly dirty ice were recovered from samples corresponding to the bottom of the ice core. This is in contrast to the rest of the ice core, which exhibits no visible dust layers. The final depth is similar to the depth calculated from radar sounding measurements, which indicated that 460m is the approximate depth of the ice.