To have a better understanding of the recent sudden climate changes, we were prompted to investigate the bacterial population in the cold climate, and their role in ice nucleation activity. Snow samples were collected from March 4-12, 2009 at Barrow (71°17′44″N 156°45′59″W) in the state of Alaska in United States. The sources of snow samples were categorized as: Wind packed, accumulated, and blowing snow. Snow samples were grown at three different media and at three different temperatures: 25°C, 37°C, and at 4°C to maximize their growth rate. From the mixed population of microorganism in snow, different tendency in growing rate was observed at different temperature which might be an indication of their source of origin. The highest ice nucleation activity was recorded as 17.5°C belonging to wind packed snow sample and the lowest ice nucleation activity was recorded as 20.5°C for accumulated snow samples. The identification of cultivated bacteria is in progress. Our result indicates the existence of bacterial population with different ice nucleation ability.