

THE PolarDARN radar for Rankin Inlet (Kangiqliniq)

A large international group of scientists have joined to use radars to study high-altitude weather systems and their effects upon the low-altitude weather we experience at the ground. The SuperDARN (Super Dual Auroral Radar Network) community, with funding and/or participation from 12 countries (Canada, US, Great Britain, France, Italy, Finland, Norway, Iceland, Japan, Australia, New Zealand and South Africa), has constructed 9 radars in the northern hemisphere and 7 in the southern hemisphere (including four in Antarctica).

All of the 16 SuperDARN radars are located so as to examine the “auroral zone”(the zone of northern or southern lights) at high latitudes in the northern and southern regions of the earth. There is, however, a gap in the coverage over the polar regions. The north magnetic pole lies near Eureka, Nunavut. Only two radars, to be called the PolarDARN radars, are needed to view the entire “north polar cap” region centered around the magnetic pole. The first radar would be installed in Rankin Inlet, the second in Inuvik. We already take part in science projects at two sites in Rankin Inlet - at the “National Research Council” site (which houses a number of instruments) and, near the airport, at a small hut in which a camera and a radio ionosonde operate. The PolarDARN radars will be portable - easy to install and remove, with no environmental damage.

The radars measure the high-altitude “weather maps” (which are voltage maps, because high-altitude winds are motions of electrically charged particles driven by electrical voltages). These maps are available on the internet with only a few minutes delay. Such information is important for all satellites, because satellites fly in this high altitude weather. These satellites are extremely important to the north because they transmit most communications signals (telephone, TV, internet, etc.). Recently, scientists have found that the high-altitude weather is connected to the low-altitude weather, and the PolarDARN radar observations will help us to understand these connections.

PolarDARN can measure part of the energy from the Sun to the Earth, namely the energy that comes from the “solar wind”. This energy goes most directly to the polar regions, so these are very important regions to study. We are very fortunate that Nunavut and the NWT provide much easier access to the northern polar regions than Antarctica provides to the south polar regions.

