Executive Summary
Geothermal Heating of Airport Runways

Keeping snow and ice from building up on airport runways and taxiways is an essential part of airport maintenance/operations worldwide and requires a large investment of time and money in equipment and operational control, especially in colder climates. Current methods for removing ice and snow from airport movement surfaces consist of spraying large quantities of anti-ice chemicals on the ground and deploying a great number of snowplowing vehicles. Both the chemicals and snowplowing vehicles have adverse effects on the environment as they contribute to pollution. During poor weather conditions, keeping runways open can be a challenge as snowplow crews cannot keep up with the precipitation, causing airport closures, delays and safety concerns. Ice buildup on runways has been proven to contribute to accidents involving runway runoffs.

Heating runways with geothermal heat can prevent the buildup of ice and snow on runways and once installed, such a system could pay for it self in as little as 2-5 years. Geothermal heat has been used to melt ice and snow off roads, sidewalks, bridges and other paved surfaces for years in locations around the world. The design is simple, pipes are cut into the pavement that receive a flow of warm liquids, either from direct use geothermal water, where available, or through the use of heat exchanger systems or even hot runoff liquids from local industry or power plants . The most ideal locations to utilize geothermal heat are in areas where high-temperature water wells can be drilled for direct use. Such locations can be found through much of the western half of the United States. The team working on this proposal consists of three undergraduate students from the Aviation department and one graduate student from the Environmental and Technical Studies program at Saint Cloud State University in Minnesota.