**WHERE GRAVEL IS GOLD: USING CAPACITIVELY COUPLED RESISTIVITY TO EXPLORE FOR GRAVEL DEPOSITS IN NORTHERN ALASKA**

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Infrastructure development on Alaska’s North Slope requires massive amounts of gravel. Unfortunately, gravel deposits on the North Slope are not well correlated with geology; and drilling campaigns to find gravel are expensive, time-consuming, and provide only point information. However, lithology is often correlated with resistivity, and thus resistivity tools offer a potential tool for gravel exploration in this environment. We first modeled, then implemented the conventional electrical resistivity method (ERT) first as proof-of-concept over known gravel locations in 2017. Subsequent extended modeling results indicated that the dipole-dipole array, simulating the capacitively-coupled resistivity system, could potentially detect a resistivity response that might indicate buried gravel. In 2018, we used capacitively-coupled resistivity (CCR) at the same known gravel deposit with available borehole information to demonstrate and calibrate the method. Using both 5-m and 10-m line electrodes (2.5-m and 5-m cable lengths) and varying rope lengths with multiple passes provided maximum apparent depth of investigation down to 14 meters below surface. A large, tracked snow vehicle pulled the array across the tundra at approximately 2-3 kilometers (km) per hour. Mean daily data collection was about 5 km. With successful results from the initial testing, subsequent fieldwork in winter 2019 used the CCR method in a large-scale (~78 miles) exploration campaign over regions anticipated to contain gravel from geological modeling efforts. In 2019, from 78 total miles of collected CCR data, the success rate for gravel detection was ~60%, with boreholes drilled after geophysical surveys. False positive responses were correlated with relic lake beds. Borehole logs at those locations revealed sands with high moisture (ice) content at these locations, likely driving the resistivity into the gravel-interpreted range.