

Electrifying Lake Mud! Part 3

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Over the last two years of research into alternative energy sources using microbial fuel cells (MFC), I have answered the questions of which lake mud and which material generated the most electricity in a steady state. This year, my research is focused on scaling the contact surface area of the anode and cathode to understand if it would correlate to increasing power generation in a steady state for two months. The idea came from reading Dr. Bruce E. Logan's paper which showed that the microbial fuel cells could be scaled to increase electrical power output. Additionally, research by Doctor Sandy L. Calderon's team showed the formation of *Shewanella* colonies on the electrode surface, meaning with additional surface area, more colonies should be present. To explore this, ten MFCs with different diameters were assembled using mud from The Great Salt Lake. Capacitors and LEDs were used to help calculate the power generated. I also added resistors to reduce the LED flash rate in order for the calculations to be recorded. The results showed a correlation to the size of the contact area some of the time. The results also showed an incredible increase in max power generation of 3.5x since the first year's experiment. With these results, in the near future, this speeding train of advancements will drive the MFCs to reach an LED flash rate so fast that the human eye won't be able to see the intervals. The light will just be on!