

# Proposed Impact Lakes in the Russian Heartland

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Using satellite imagery, data gathered from ArcGIS, matlab analysis, various microscopes, and geochemical tools, we studied samples from 3 lakes: Smerdyachee, Svetloyar, and Lemeshinskoye in an attempt to discern if they are impact craters. Lake Smerdyachee has a major axis of 268 meters and a minor axis of 260.6m, which results in an eccentricity of 0.23. In 2014 the depth was measured with a himminbird 717 sonar and the maximum depth was found to be 32.5 meters, which is uncharacteristically deep for lakes of this diameter. Silicified Paleozoic fossils have been found on the southern rim of Lake Smerdyachee, however, no discernable calcium carbonate was detected. Roughly 5 kilometers to the southwest lies Lake Lemeshinskoye which has a major axis of 367 meters and a minor axis of 282 meters resulting in an eccentricity of 0.64. The calculated ellipse is oriented almost due North-South with a trend of 269°. We found two iron oxide spherules, a platy piece of magnetic iron oxide, and second platy grain with octahedral crystals of iron oxide and nickel at the 0.5% level. These grains were found in possible sub craters near the lake. Further studies into Lemeshinskoye and other lakes examined with remote sensing technologies could provide valuable information on their origins.