



LIGHTHOUSE ARCHAEOLOGY

Michigan has more lighthouses than any other state, and Michigan's oldest light is approaching 200 years in age. Lighthouses could be simple, single buildings, or larger complexes with several buildings, each with its own purpose. As technologies changed and improved, new buildings and functions of a light station complex changed too, such as the changeover from whale oil to kerosene, or the addition of indoor plumbing rendering a privy as no longer needed. In some cases, the lighthouse tower itself was rebuilt or replaced with a more modern example.



These weren't just workplaces, but were homes, too. The lightkeeper and their family typically lived on the property, often with children, and it was the center of their domestic life. Many lighthouse properties included gardens, sidewalks or trails, fences, and docks, beyond the essential lighthouse building(s). When you visit a lighthouse today, you may be seeing only half the picture. Lighthouse archaeology can tell us more about the buildings and structures that once stood on the site, and how the people who lived here spent and enjoyed their time.

This year's poster includes imagery of a Ground Penetrating Radar (GPR) unit being used at Fort Gratiot Light Station in Port Huron, Michigan's oldest light. The oldest known photograph of Fort Gratiot dates from 1873, but a lighthouse has been located here since 1825, meaning we can learn a lot from the site's archaeology.

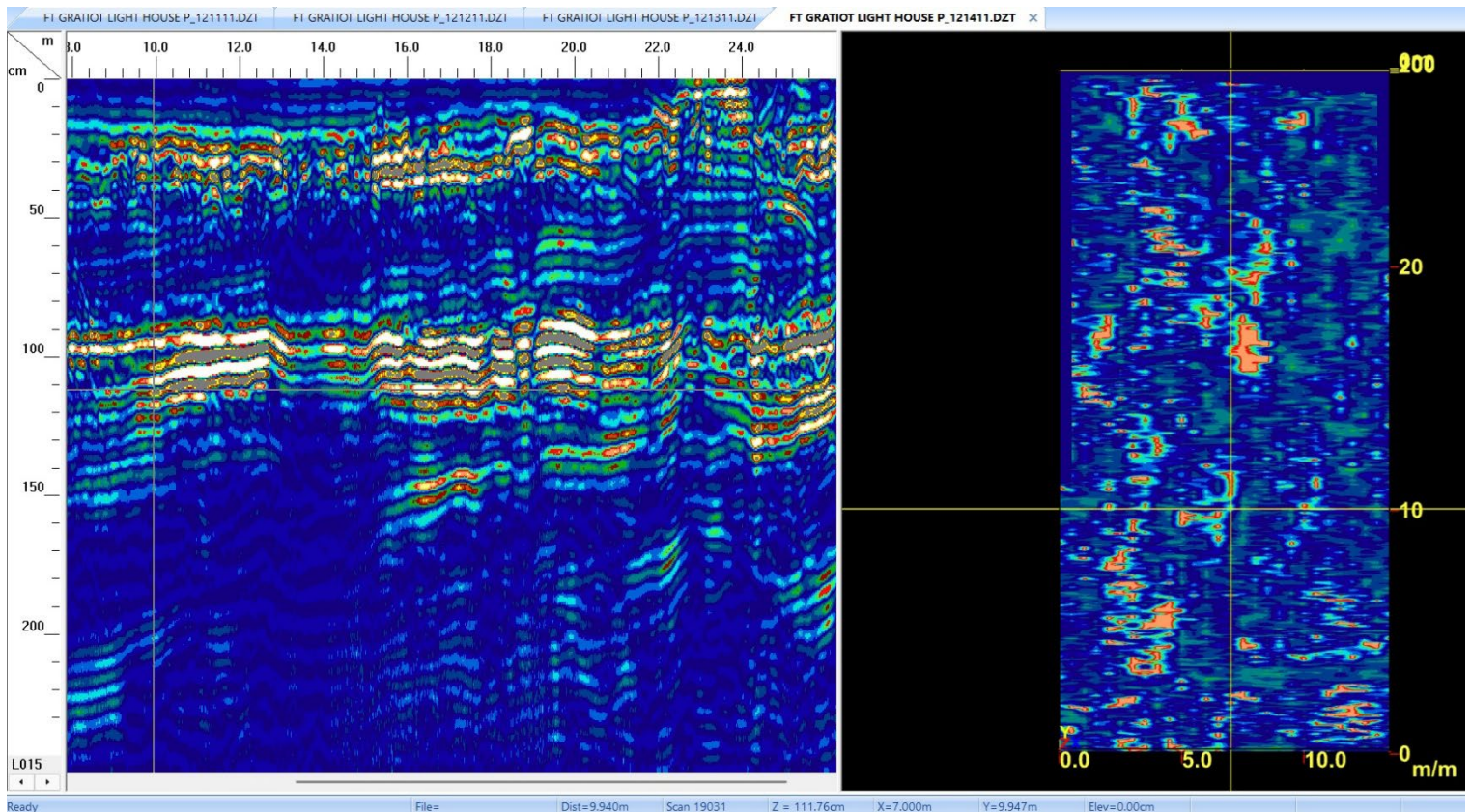
The earliest known photograph of Fort Gratiot depicts several smaller buildings which no longer exist. [View this image at full size for more detail.](#)

(National Archives collection)

What did the GPR “see?”

To start, a site is laid out with a systematic coordinate grid. The GPR unit is then pushed or pulled over the grid in parallel lines, maintaining uniform spacing to the highest extent possible. GPR devices have a display, allowing the operator to view visual data as the unit travels. GPR presents data both illustrating the depth of anomaly returns, and maps where on the grid the anomalies are found.

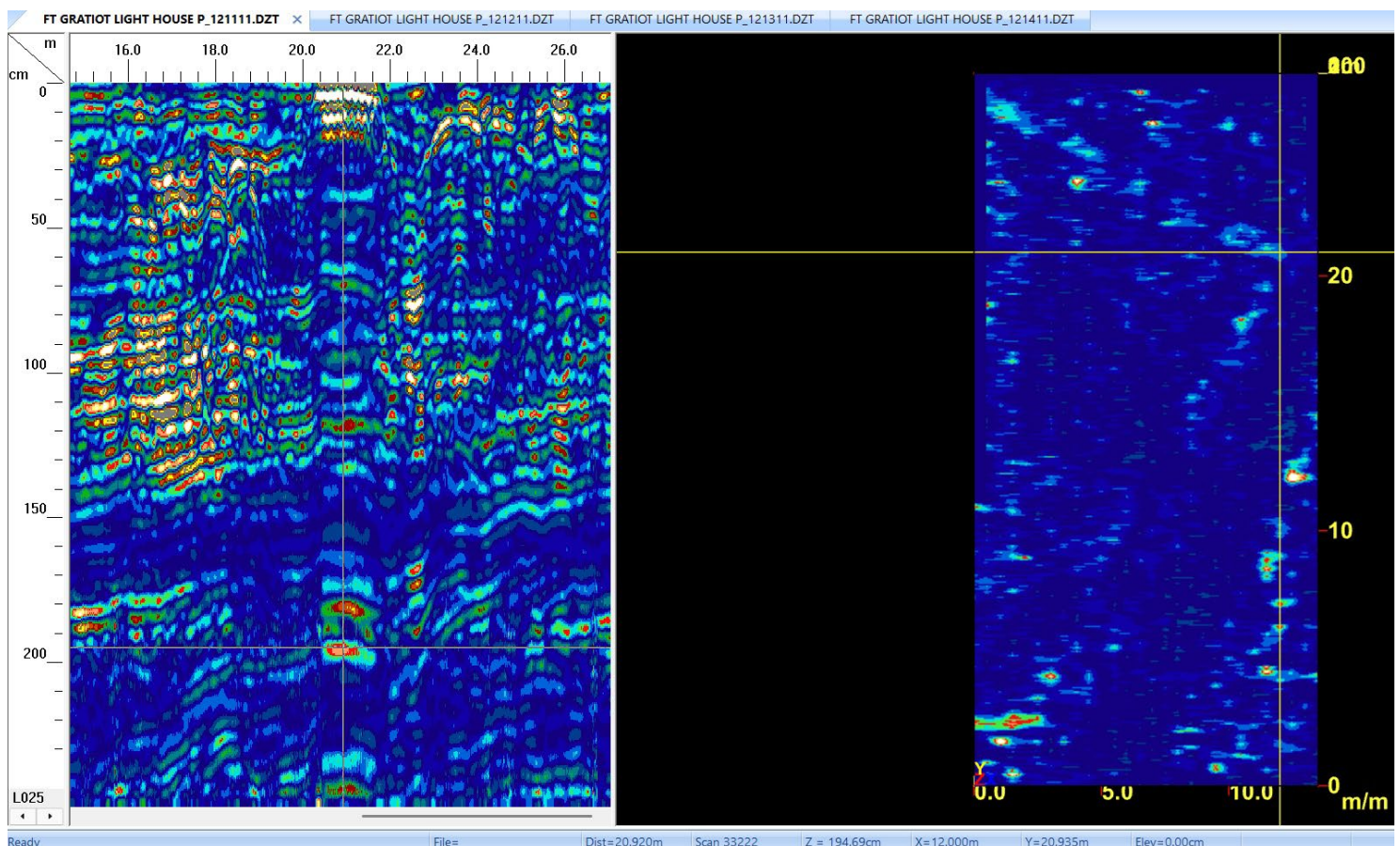
The data captured at Fort Gratiot found two rectilinear anomalies (rectangular forms). The shallower anomaly is approximately 2.3 X 2.1 meters in area and is visible between 104 cm and 124 cm below the surface. Two right angles are visible in these images. This appears to be a small foundation of some type, possibly a privy.



In this GPR graphic, the image on the left illustrates a depth profile from the surface (top) to a depth of 230 cm (bottom). The white stripes traveling from left toward the right just above and below the 100 cm mark are the solid anomaly returns that suggest a long solid object such as a foundation is present. Red spots within the white lines suggest “gaps,” perhaps where material was stacked on top in layers. The image on the right is a plan view of the coordinate grid. The crosshairs in both images align, helping to match up where on the site the anomaly is present.

[See a larger version of this image.](#)

The second anomaly is much larger and extended off the west side of the survey grid. What is visible is approximately 20 meters by 10 meters in length and clearly makes a right angle. This looks like a large foundation wall, fence row, or palisade wall that runs diagonally across the grid. Because this anomaly is deep (212 cm below the surface) the returning reflections are very faint. This required experimentation with several high pass/low pass filters to bring out different details.



Similar to the first image, the GPR graphic on the left is a depth profile down to about 250 cm, and the image on the right is a site plan of the coordinate grid. In the plan view, note the returns at a consistent depth, stretching from the upper left corner to where the crosshairs meet, and then stretching diagonally to the lower left corner, forming a right angle at the crosshairs. This illustrates the much larger size of this anomaly compared to the first. The depth profile shows the strong return (red and orange) at the depth of approximately 200 cm, or six and a half feet deep.

[See a larger version of this image.](#)

This GPR data can be paired with known historical information about Fort Gratiot Light to help determine what these anomalies might be. Historical narratives and earlier maps of the site can be matched with the returns from the GPR to help historians better understand how the site changed over time. One thing is for certain – not all of Fort Gratiot’s history is above ground!



Learn more about Fort Gratiot Light Station history! The Historic Structures Report for the entire complex was completed in 2007 and offers a detailed history of the station’s development and changes over nearly 200 years of history, including historical maps, photographs, and site sketches.

[External link to the Fort Gratiot Light Station Historic Structures Report.](#)



Love lighthouse history? You can help!

Michigan Drivers! When you upgrade to a SAVE OUR LIGHTS license plate for your vehicle, you don't just get to show off your love of lighthouses. You actively support our Michigan Lighthouse Assistance Program grant fund to help keep Michigan's historic lights in good repair! Michigan has more lighthouses than any other state and with your help, they all have a bright future. Get the plate, Save a Light!

Learn more about lighthouse preservation and apply for the plate at

www.michigan.gov/saveourlights

