

An In-Depth Explanation of Why GPR Is Used on Residential School Sites

Introduction

Ground Penetrating Radar (GPR) has become a critical tool in the investigation of former residential school sites. These sites are being examined to locate unmarked graves and to uncover historical injustices related to the treatment of Indigenous children who were forced to attend these institutions. GPR is used because it is a non-invasive, efficient, and scientifically reliable method for detecting subsurface anomalies, including potential burial sites.

This explanation will cover the **historical context, reasons for using GPR, how GPR works in these investigations, challenges associated with its use, and ethical considerations.**

1. Historical Context: The Need for Investigation

Residential schools were government-funded, church-run institutions designed to assimilate Indigenous children into Euro-Canadian culture. Operating for over a century, these schools subjected children to harsh conditions, abuse, and neglect. Many children never returned home, and records regarding their deaths are often incomplete or missing.

Reports from survivors, historical documents, and the findings of the **Truth and Reconciliation Commission (TRC) of Canada** indicate that unmarked graves exist at many former school sites. The need for forensic investigation has led to the widespread use of GPR.

2. Why GPR Is Used at Residential School Sites

Several key reasons make GPR the preferred method for investigating unmarked graves at these locations:

2.1. Non-Invasive and Respectful

- Many Indigenous communities have deep cultural and spiritual ties to burial sites.
- GPR allows for the identification of potential graves without disturbing the ground.
- This respects both the wishes of survivors and the dignity of those who may be buried.

2.2. Ability to Detect Unmarked Graves

- Many burial sites lack headstones or visible markers due to intentional removal, erosion, or neglect.
- GPR can identify anomalies in the soil, such as changes in composition, air pockets, or disturbed earth, which may indicate graves.

2.3. Historical Record Verification

- Survivor testimonies often provide crucial leads regarding burial sites.

- GPR helps confirm or refute historical records, providing physical evidence to support oral histories.

2.4. Supporting Truth and Reconciliation Efforts

- Identifying unmarked graves contributes to the process of truth-telling and acknowledgment of past injustices.
- It aids in closure for families and communities who have long sought answers.

2.5. Legal and Forensic Investigations

- Findings from GPR surveys can be used as part of broader forensic and archaeological investigations.
 - Some sites may warrant further forensic analysis, including excavation and DNA testing.
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3. How GPR Works in Residential School Investigations

GPR works by transmitting electromagnetic waves into the ground and analyzing the reflected signals to detect subsurface structures. The process in these investigations typically includes:

3.1. Site Selection and Preparation

- Researchers collaborate with Indigenous communities to identify locations of interest.
- Historical maps, records, and survivor testimonies help narrow down search areas.

3.2. GPR Scanning Process

- A radar unit is pushed along the ground in a systematic grid pattern.
- Different frequencies are used to balance depth penetration and resolution:
 - **High-frequency antennas (e.g., 900 MHz – 1 GHz):** Provide detailed imaging for shallow depths.
 - **Lower-frequency antennas (e.g., 250 MHz – 500 MHz):** Penetrate deeper to detect older or deeper graves.

3.3. Data Interpretation

- Raw data must be analyzed by experts to differentiate between natural soil variations and potential graves.
- GPR images do not show bodies or bones but reveal soil disturbances that suggest burial sites.

3.4. Confirmation Process

GPR results alone do not confirm the presence of human remains.

- Additional methods, such as archival research, oral histories, and forensic excavation (if permitted by the community), may be required.
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4. Challenges and Limitations of GPR in These Investigations

Despite its effectiveness, GPR investigations at residential school sites face several challenges:

4.1. Depth and Soil Conditions

- Wet, clay-heavy, or highly mineralized soil can distort signals, making detection difficult.
- Shallow graves, common in historical burial sites, may be more challenging to differentiate from natural soil layers.

4.2. Data Interpretation Complexity

- GPR does not provide direct images of bodies; it only detects disturbances.
- Interpreting data requires expertise, and misinterpretations can occur.

4.3. Ethical and Cultural Considerations

- Many Indigenous communities have specific protocols regarding burial sites and ancestral remains.
- Decisions about further investigations (e.g., excavation) must be made in collaboration with the affected communities.

4.4. Emotional and Psychological Impact

- GPR investigations can be emotionally distressing for survivors, families, and community members.
- Proper support, including trauma-informed approaches, is essential during and after investigations.

5. Ethical Considerations and Community Involvement

Because of the sensitive nature of these investigations, ethical considerations are paramount:

5.1. Indigenous Leadership and Consent

- Investigations should only proceed with the guidance and consent of affected Indigenous communities.
- Communities must have control over the process, including decisions about data sharing and next steps.

5.2. Transparency and Sensitivity

- Findings should be communicated with care, ensuring that communities are informed before public announcements.
- Respectful language should be used when discussing potential graves.

5.3. Next Steps and Action Plans

- If unmarked graves are detected, communities should decide whether to preserve, mark, or further investigate them.
 - Governments and institutions must be held accountable for past actions and work toward reconciliation.
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6. Conclusion

GPR has become an essential tool in investigating unmarked graves at former residential school sites. Its **non-invasive, respectful, and scientifically reliable** nature allows for the detection of burial sites without disturbing the ground. However, GPR is only one part of a larger effort that includes **historical research, survivor testimonies, and Indigenous-led decision-making**.

The use of GPR in these investigations contributes to the broader goals of **truth, accountability, and reconciliation**, helping communities find answers, honor those who were lost, and ensure that history is acknowledged.

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