GEM SYSTEMS

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Technology Overview:

1. Technological improvements facilitate high resolution and lower cost geophysical mapping of large areas for environmental uses.

2. New non-metallic geophysical trailer towed by an All Terrain Vehicle (ATV) increases acquisition speed and data reliability.

3. Pocket PC (PDA) manages multiple geophysical methods and allows the user to simultaneously satisfy complex site objectives.

4. Global Positioning System (GPS) navigation provides a greater degree of control with accuracy needed to perform:

    1. Time-based (dynamic) evaluation of remediation progress
    2. Post-remediation clearance confirmation for regulatory needs

5. Data processing advances deliver near real-time results.

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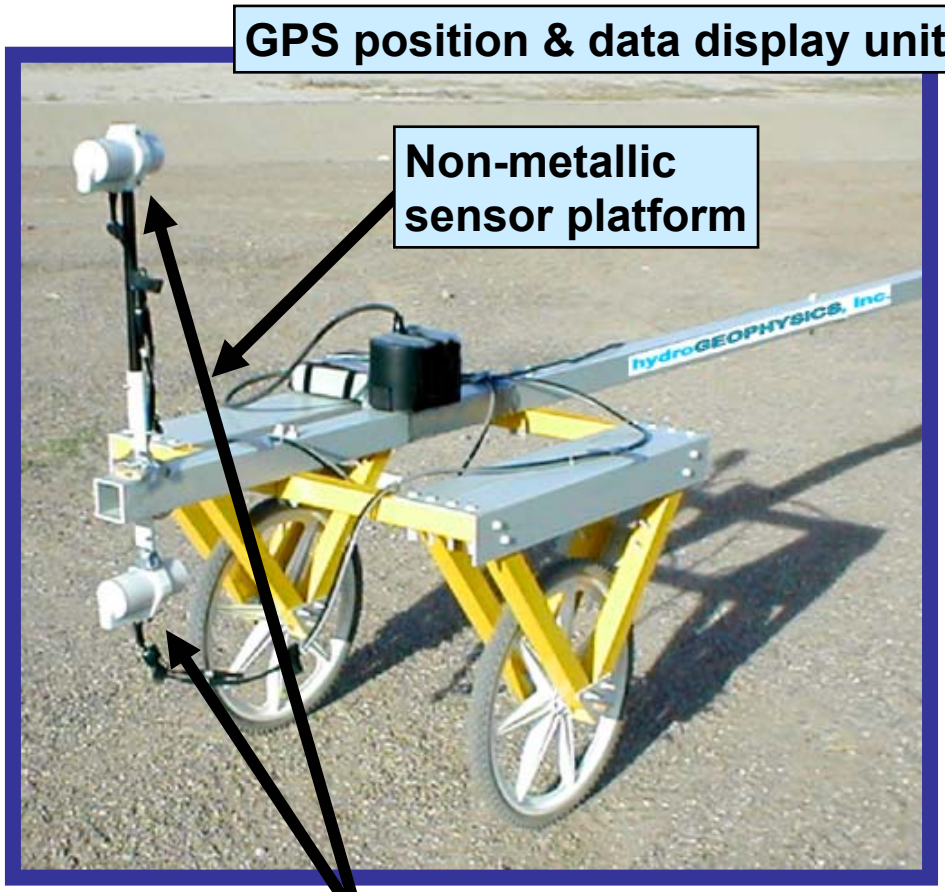
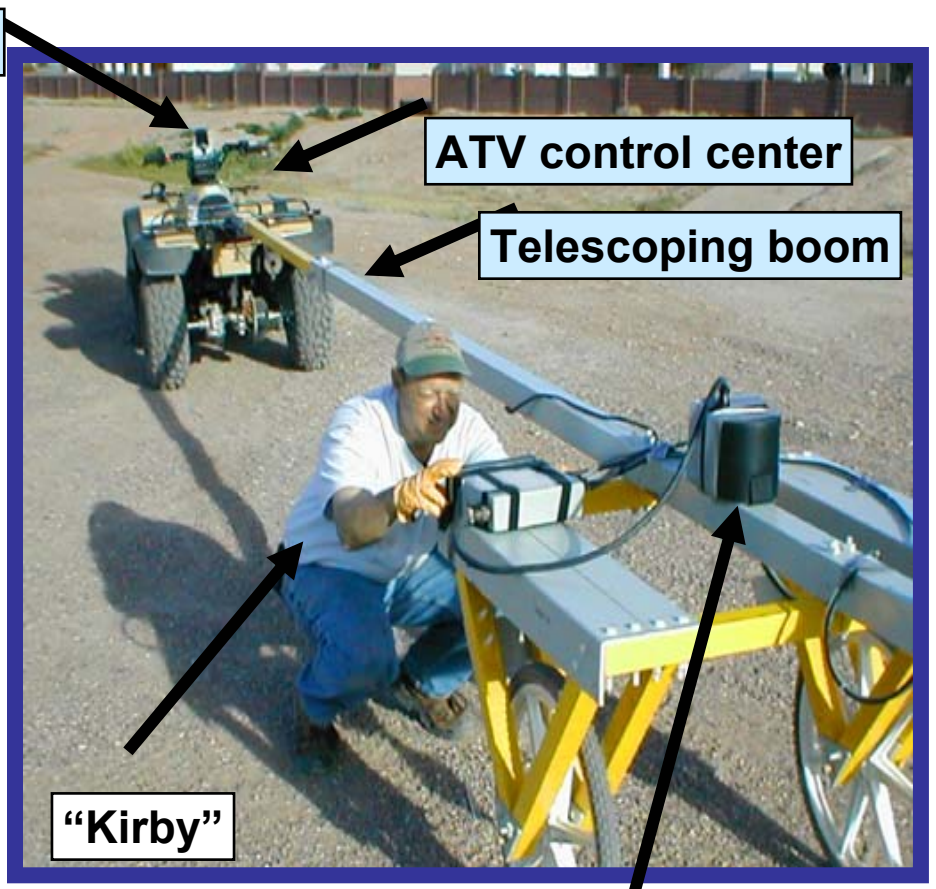
GO-CART – Geophysical Operations CART





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GO-CART – Geophysical Operations CART

- **Non-metallic extruded fiberglass construction provides a rigid platform for use over rugged terrain.**
- **Separate wheel mounts provide over 2.5 feet of ground clearance. Area between wheels can be used to for mounting ground-coupling sensors.**
- **Telescoping boom allows up to 30 feet of separation between ATV and sensors (eliminates metallic and electrical noise).**
- **ATV houses large capacity 12V power source and provides operator with a real-time, heads-up display showing location, speed and acquired data.**

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Integrated Technologies

METHOD	INSTRUMENT	MAPPING CAPABILITY
Magnetics		• Buried object and infrastructure detection (debris, barrels/drums, wells, caissons, utilities) • Soil and structure characterization
Multi - frequency Electro - magnetics (EM)		• Buried object and infrastructure detection (trenches, debris, barrels/drums, utilities) • Soil and structure characterization • Plume detection and delineation
Very Low Frequency EM		• Fracture and fault mapping
Radiometrics		• Gamma spectrometry • Radionuclide characterization
Capacitively Coupled Resistivity		• Soil and structure characterization • Plume detection and delineation

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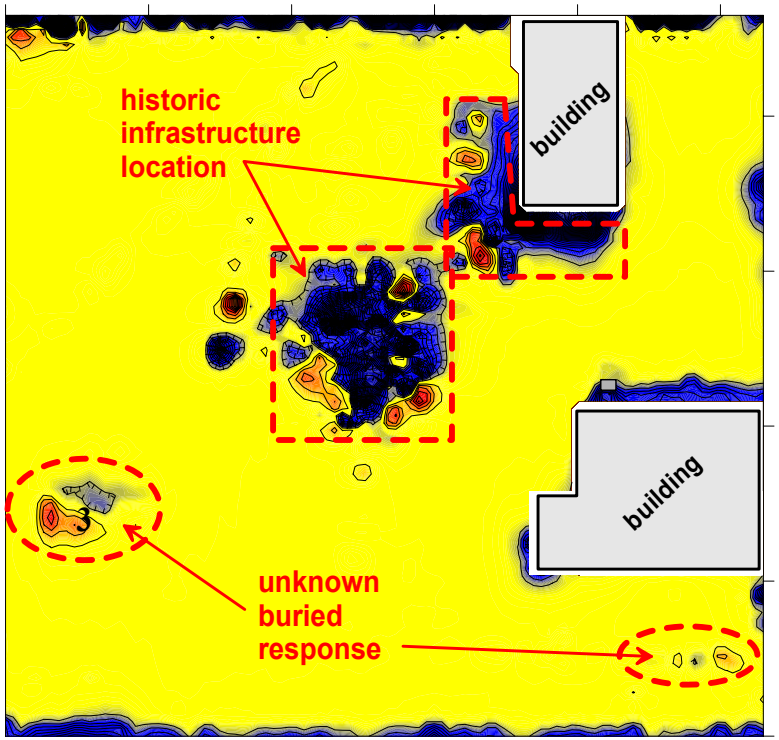
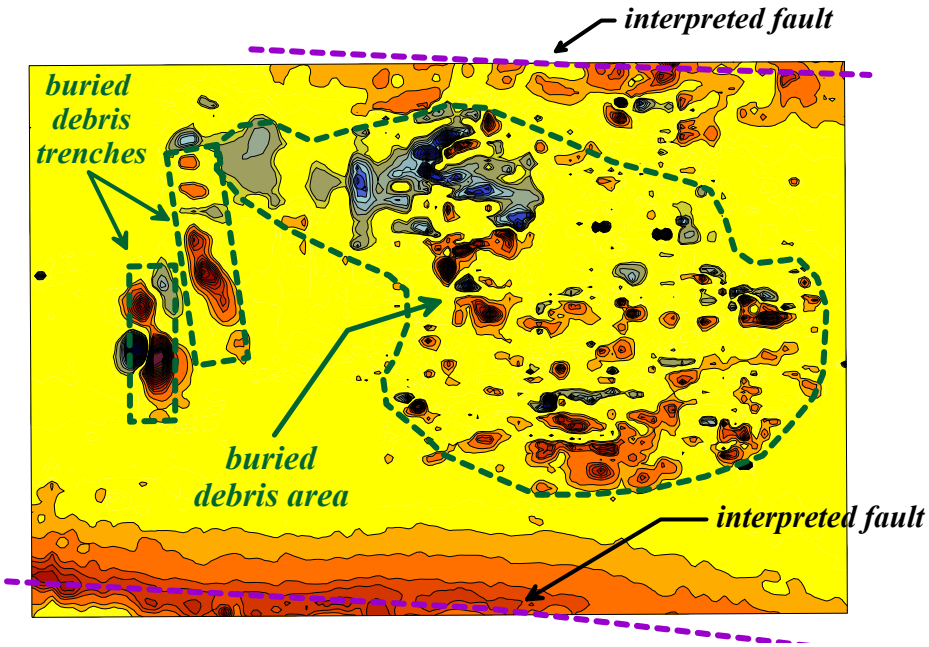
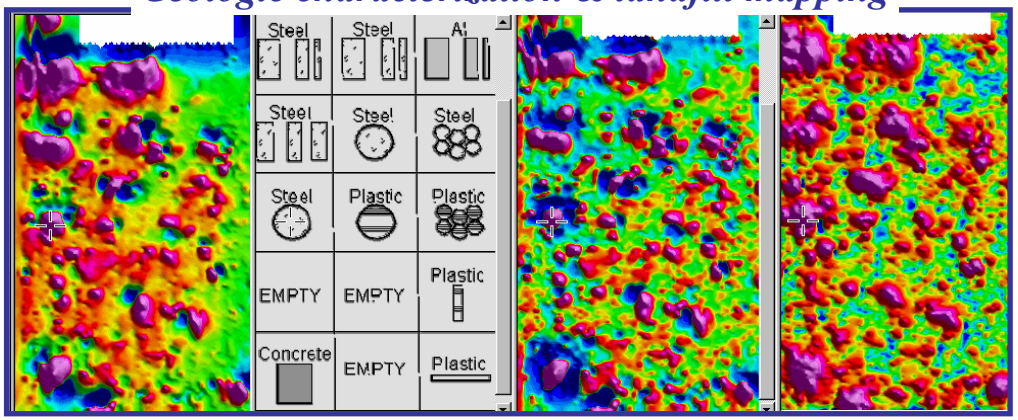
Magnetic Surveying



Buried infrastructure detection



Geologic characterization & landfill mapping



Buried object detection

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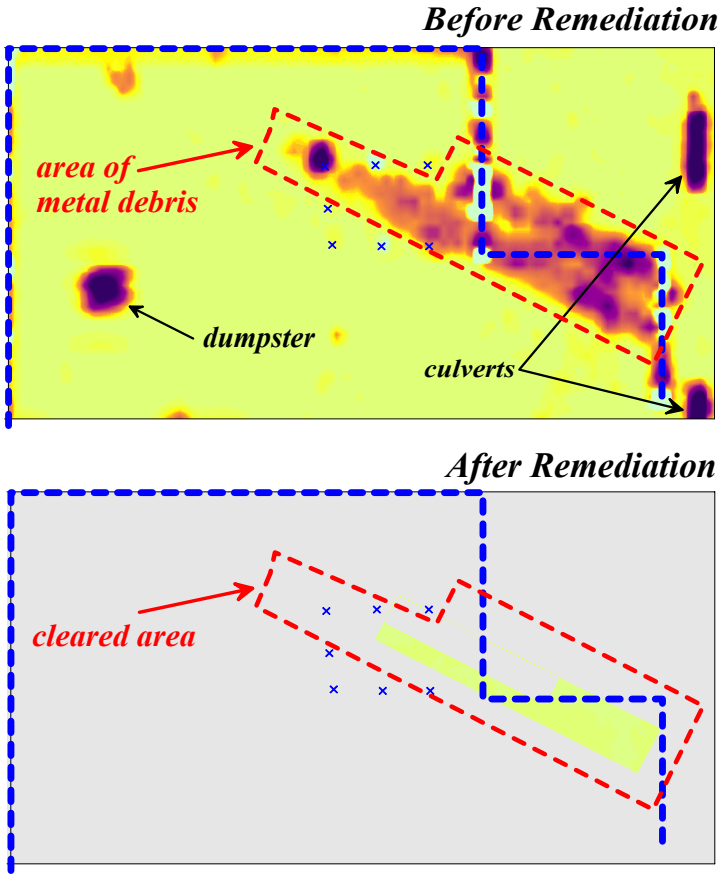
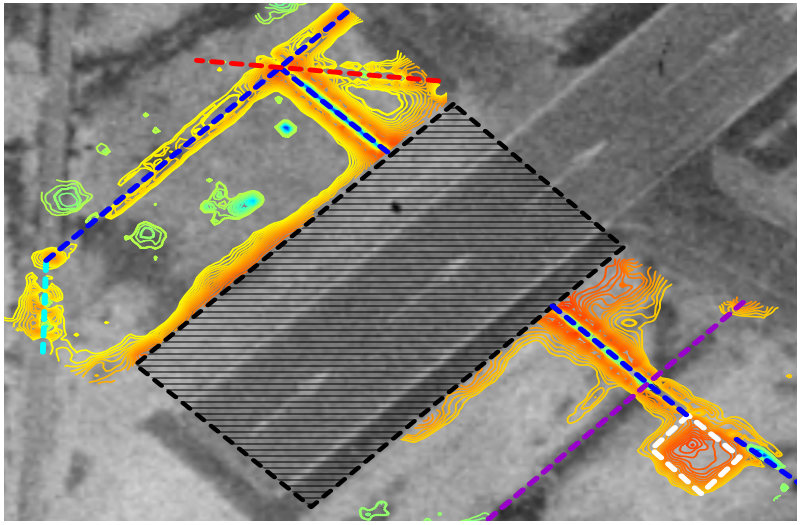
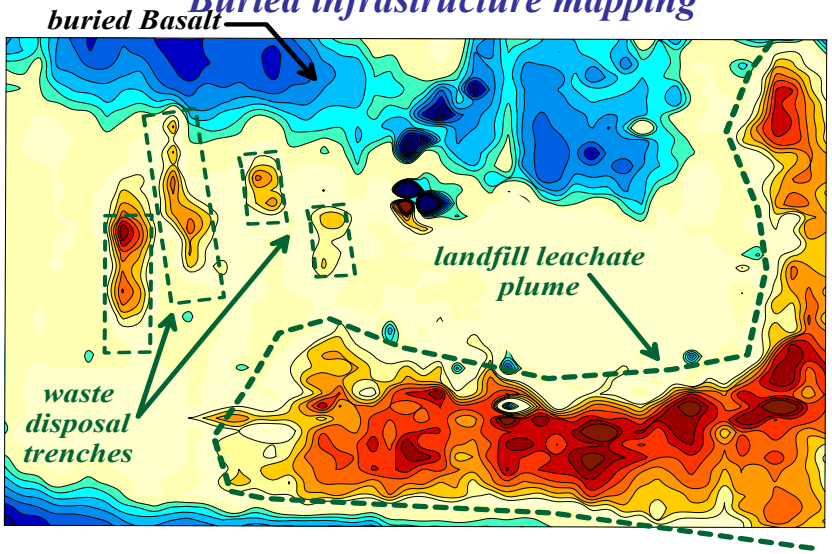
Electromagnetic Surveying



Buried object detection and site clearance



Buried infrastructure mapping



Geologic characterization & plume mapping

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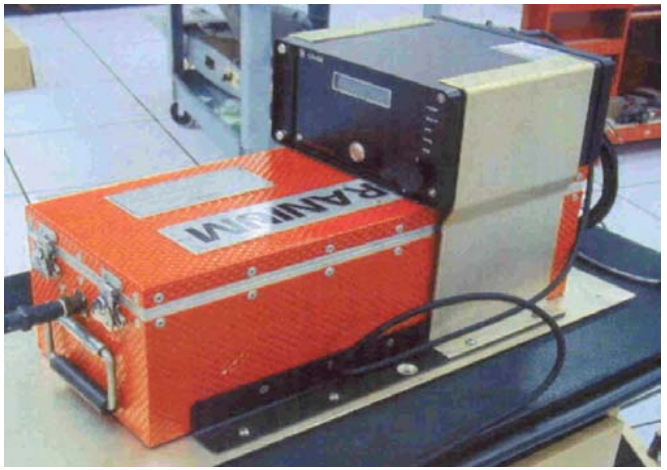
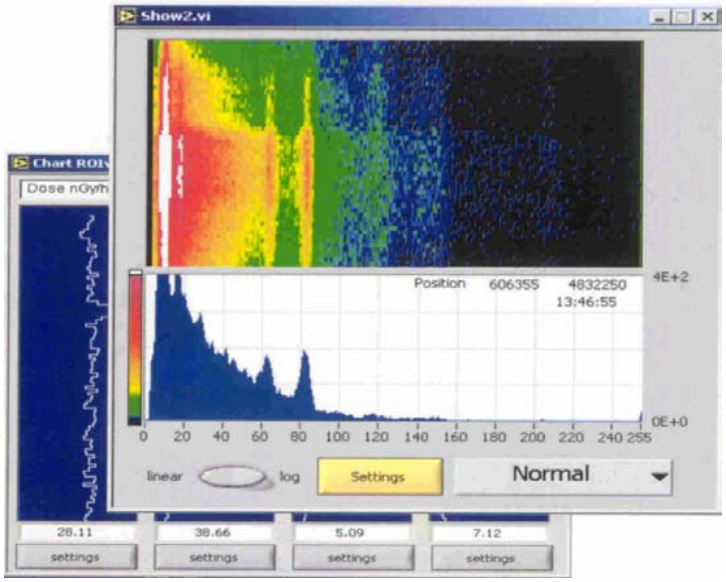
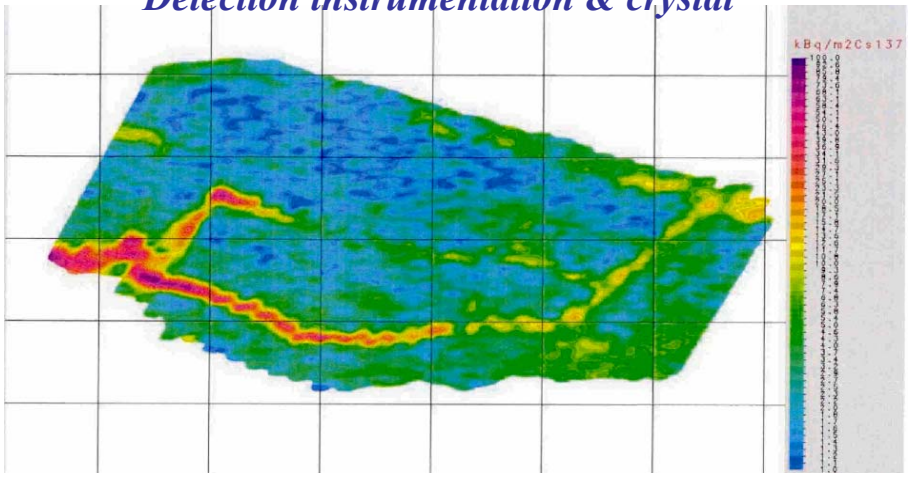
Radiometric Surveying



Detection instrumentation & crystal



Spectral processing software for selecting and monitoring energies from specific transuranic emitters



Contour map of radiometric results

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Characterization Issues: Hanford Burial Ground

The ***GO*-CART** system will be most effective at Hanford for:

1. Pre-remediation surveying for background baseline measurement.
2. Pre-remediation characterization of waste and soil variability.
3. Potential magnetic mapping of areas affected by burning.
4. High precision location of trenches, caissons and drums for excavation.
5. Post-remediation surveying for regulatory compliance and documentation.

Presenters:

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