

Subject: Ground-penetrating radar field studies Date: November 4, 1988
 in Mississippi; October 26 & 27, 1988

To: David Jones
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File code: 430-6

Purpose:

To explore the potential of using ground-penetrating radar (GPR) techniques for soil investigations in MLRA 131 (Southern Mississippi Valley Alluvium) of Mississippi.

Participants:

Floyd Brent, Area Soil Scientist, SCS, Greenwood, MS
Johnny Chism, Res. Conservationist, SCS, Greenwood, MS
Dwain Daniels, Soil Scientist, SCS, Greenwood, MS
Jim Doolittle, Soil Specialist, SCS, Chester, PA
Robert Hinton, Soil Correlator, SCS, Jackson, MS
Steve Holman, Soil Cons. Technician, SCS, Clarksdale, MS
Jerry Huddleston, Soil Scientist, SCS, Grenada, MS
George Roland, District Conservationist, SCS, Clarksdale, MS
William Smith, Ass't. State Soil Scientist, SCS, Jackson, MS
Curtis Stover, Geologist, MS Bureau Environmental Geology, Jackson, MS
Robert Wimbish, Soil Scientist, SCS, Greenwood, MS

Activities:

I arrived in Greenwood, Mississippi, on the evening of 25 October 1988. Field studies were conducted near Tutwiler and Clarksdale on 26 October; and near Greenwood on 27 October. I departed Greenwood for an archaeological field study at Poverty Point, SCA, Louisiana during the afternoon of 27 October.

Discussion:

GPR field studies were conducted in areas of Bosket (fine-silty, mixed, thermic Mollic Hapludalfs), Bruno (sandy, mixed, thermic Typic Udifluvents), Dubbs (fine-silty, mixed, thermic Typic Hapludalfs), and Dundee (fine-silty, mixed, thermic Aeric Ochraqualfs) soils. These soils are representative of the loamy and sandy alluvial soils in MLRA 131.

The performance of the GPR was generally poor in the more extensive loamy soils and good in the sandy soils. Depth of penetration was

restricted to the upper part of the argillic horizon in all Alfisols. In most areas, the relatively high clay contents of Bosket, Dubbs, and Dundee soils restricted radar penetration to depths of 60 to 70 centimeters. In areas of medium and moderately-fine textured soils, the use of GPR techniques for soil investigations is limited.

The performance of the GPR in the sandy Bruno soils was good and depths of 2 meters or more can be consistently scanned. The water table and strata within the substratum were easily discerned and traced on most radar profiles. Though limited in extent, the GPR can be used effectively for soil and groundwater investigations in areas of sandy soils within MLRA 131.

Results:

This brief field study enabled soil scientists in Mississippi to become knowledgeable of the uses of GPR and its application within MLRA 131. While results were generally poor, this study has advanced SCS's understanding of the application of GPR techniques within the Lower Mississippi Valley Alluvium Region. On the basis of this study, potential areas for successful radar applications within Mississippi were suggested by Robert Hinton.

The field study was an informative and enjoyable experience. Hopefully, further studies with the GPR can be carried out in selected areas of Mississippi. With kind regards.

JAMES A. DOOLITTLE
Soil Specialist (GPR)

cc:
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