

Geoarchaeology, Geomorphology, Pedology

GAI Consultants reconstructs the activities of past cultures using geoarchaeology, geomorphology, and pedology to analyze soil, geographic, and sediment data. Our specialists in these fields work alongside our archaeologists on investigations from Phase IA sensitivity assessments through Phase III site mitigations to develop a framework for evaluating cultural resources effectively.

Using geomorphological assessments to eliminate cultural resource test areas means project costs are lowered and less time is spent on preliminary investigations.

Serving clients from local, state, and federal agencies as well as private firms and institutions, GAI's geoarchaeology program is tailored to each client's project-specific needs. We provide background evaluations on Phase IA projects for predictive modeling, and determine soil properties during backhoe excavations and deep testing on

Phase IB projects. On Phase II projects, we develop detailed soil profiles and conduct background research to enhance our understanding of the depositional context and importance of the site.

GAI's Phase III mitigation work involves soil sampling and geomorphic evaluations. We study geomorphological features and characteristics of an archaeological site to help reconstruct the past. Various geomorphic properties, processes, and conditions influence the extent to which cultural resources are preserved in place, moved, modified, or destroyed. GAI uses thorough geomorphological assessments to eliminate test areas. This cost- and time-saving approach is accepted by permitting agencies and State Historic Preservation Offices.

Because climatic and biological environments are affected by the evolution of landscapes, GAI uses pedology to study the natural setting of soils as 3-dimensional bodies and conducts investigations within a stratigraphic framework that emphasizes the spatial distribution and temporal implications of buried soils.



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Service Profile



GAI’s laboratory analysis of geoarchaeology samples provides a great deal of information on site formation. We use particle-size analysis to interpret subtle differences in soils and sediments that are often not discernible in the field but are critical to interpretation. Our chemical assays include organic carbon, soil pH, and phosphorous, and radiocarbon analysis. We also use petrographic analyses (micromorphology), which are specialized studies of geologic samples in thin sections that use a petrographic polarizing microscope that is applied to cherts, ceramics, and soils.

GAI’s on-site analyses provide quantitative data on site formation, which we use to place cultural resources into their proper historic environmental context. Our full-time pedologist/geomorphologist uses detailed soil evaluations to reconstruct historic landscapes and climates and to interpret human-induced changes in the soil. These findings influence how cultural resources are interpreted.

GAI is uniquely qualified to assist our clients with advanced services in geoarchaeology, geomorphology, and pedology. Our degreed professionals are dedicated to exploring soils for information on reconstructing the past, aligning with our goals to manage cultural resources without impeding progress.

Geoarchaeology, Geomorphology, Pedology Services

- Geomorphology reconnaissance
- Local geomorphology and soil survey
- Stratigraphic soil profile evaluations
- Soil auger transect studies
- Petrographic analysis
- Ceramic thin section analysis
- Detailed soil profile evaluations of individual test units
- Soil and sediment laboratory analysis

GAI Services Summary

- Airport Planning and Design
- Bridge and Structure Inspection and Design
- Coal Combustion Residuals Management
- Construction Inspection and Management
- Cultural Resources Management
- Economic Analyses and Strategies
- Electric Transmission Design and Siting
- Environmental Engineering
- Environmental Studies, Species Studies, Permitting
- Gas Pipeline Surveying and Mapping
- Geographic Information Systems (GIS)
- Geotechnical Engineering and Geology
- Impoundment and Landfill Permitting and Design
- Land Development Engineering
- Landscape Architecture and Design
- Master Planning and Urban Design
- Mechanical, Electrical, Structural Engineering
- Natural Gas FERC Certification and Permitting
- Nuclear Energy Engineering Support
- Right of Way and Appraisal Support
- Land Surveying and Mapping
- Transportation Planning and Design
- Utility Management Consulting
- Water, Stormwater, Wastewater Management

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