

**Center for American Archeology
2008 Geoarchaeology Workshop Annotated Bibliography**

General Guides/Textbooks Dealing With Geoarchaeology:

Brown, A.G.

1997 *Alluvial Geoarchaeology: Floodplain Archaeology and Environmental Change*. Cambridge Manuals in Archaeology, Cambridge University Press.

[Focuses on the archaeological implications of river system dynamics, with examples from the Old and New Worlds. Includes sections on: Floodplain Evolution; Alluvial Environments Over Time; Interpreting Floodplain Sediments and Soils; Floodplain Ecology, Archaeobotany and Archaeozoology; Artifacts from Floodplains and Rivers; The Rise and Fall of Forested Floodplains in North-West Europe; Buried Sites; Managed Floodplains; The Cultural Archaeology of Floodplains; People, Floodplains and Environmental Change; River Flow and Sediment Transport; Flood Frequency Analysis; and Documentary Evidence and Wetland Perceptions.]

Garrison, Ervan G.

2003 *Techniques in Archaeological Geology*. Springer-Verlag, Berlin and New York.

[Geoarchaeology textbook from a European perspective. Includes sections on: Survey and Mapping the Geomorphological and Geological Context; Geophysical Techniques for Archaeology; Field Sampling Techniques for Archaeological Sediments and Soils; Analytical Techniques for Archaeological Sediments; Petrography for Archaeological Geology; Instrumental Analytical Techniques for Archaeological Geology; Statistics in Archaeological Geology.]

Goldberg, Paul, Vance T. Holliday and C. Reid Ferring (editors)

2001 *Earth Sciences and Archaeology*. Kluwer Academic/Plenum Publishers, New York.

[Includes separate sections, most with multiple chapters, titled Background; Geomorphological Studies; Soils, Sediments, and Microstratigraphy; Specific Techniques; Geochemical Methods; and A Prehistorian's Perspective.]

Harris, Edward C., Marley R. Brown III, and Gregory J. Brown (editors)

1993 *Practices of Archaeological Stratigraphy*. Academic Press, London.

[Explains techniques for stratigraphic analysis, primarily through the use of the Harris Matrix. Mostly deals with artifact/feature stratigraphy, but some sections deal with artifact/sediment relationships as well. Includes the sections: Historical trends; Analysis in excavation; Phasing and structural analysis; Post-excavation analysis; and Future developments.]

Holliday, Vance T. (editor)

1992 *Soils in Archaeology: Landscape Evolution and Human Occupation*. Smithsonian Institution Press, Washington D.C.

[Edited volume of papers in geoarchaeology, including: Alluvial Pedology and Geoarchaeological Research; Soils and Holocene Landscape Evolution in Central and Southwestern Kansas; Soil Formation, Time, and Archaeology; Soil Morphologic Properties and Weathering Zone Characteristics as Age Indicators in Holocene Alluvium in the Upper Midwest; Micromorphology, Soils, and Archaeological Sites; Soil Properties of Wadi Feiran, Sinai; Organic Matter in Archaeological Contexts; and Long-Term Effects of Prehistoric Agriculture on Soils: Examples from New Mexico and Peru.]

Holliday, Vance T.

2004 *Soils in Archaeological Research*. Oxford University Press.

[As of 2007, most up-to-date and comprehensive text on soils and archaeology. Numerous examples of studies, including sections on: Terminology and Methodology; Conceptual Approaches to Pedogenesis; Soil Surveys and Archaeology; Soil Stratigraphy; Soil Stratigraphy in Geoarchaeological Contexts; Soils and Time; Soils and Paleoenvironmental Reconstructions; Soils and Landscape Evolution; Soil Genesis and Site-Formation Processes; Human Impacts on Soils; Variations on U.S. Department of Agriculture Field Nomenclature; Soil Phosphorus: Chemistry, Analytical Methods, and Chronosequences; and Variability of Soil Laboratory Procedures and Results.]

Mandel, Rolfe D. (editor)

2000 *Geoarchaeology in the Great Plains*. University of Oklahoma Press, Norman.

[Several authors (all geoarchaeologists) explore the history and development of Great Plains geoarchaeology in this volume. Each chapter concentrates on the development of the discipline in specific regions, but a great deal of the actual geoarchaeology is explained as well.]

Rapp, George (Rip) Jr. and Christopher L. Hill

2006 *Geoarchaeology: The Earth-Science Approach to Archaeological Interpretation, 2nd Edition*. Yale University Press, New Haven.

[Good introductory text to geoarchaeology. Includes sections on: Theoretical and historical overview; Sediments and soils and the creation of the archaeological record; contexts of archaeological record formation; Paleoenvironmental reconstructions; Raw materials and resources; Provenance studies; Estimating age in the archaeological record; Geologic mapping, remote sensing, and surveying; Construction, destruction, site preservation, and conservation.]

Reed, Stewart; Nathan Bailey and Oghenekome Onokpise

2000 *Soil Science for Archeologists*. Edited by Michael Russo and Virginia Horak,

Florida Agricultural and Mechanical University and Southeast Archeological Center, National Park Service.

[Guide to soils and soil description, available free on-line here:

<http://www.nps.gov/history/seac/soils-index.htm>.]

Stein, Julie K. and William R. Farrand (editors)

2001 *Sediments in Archaeological Context*. The University of Utah Press.

[Focuses on the archaeological implications of sedimentary processes in various environments, including: Cultural Environments; Rockshelters and Caves; Dryland Alluvial Environments; Humid Alluvial Environments; Lake Margin Environments; Coastal Environments; and Springs and Wetlands.]

Vogel, Gregory

2002 *A Handbook of Soil Description for Archeologists*. Arkansas Archeological Survey Technical Publication 11, Fayetteville.

[Short guide to field descriptions and interpretations of soils and sediments, includes a short glossary.]

Waters, Michael R.

1992 *Principles of Geoarchaeology: A North American Perspective*. The University of Arizona Press, Tuscon.

[Good introductory text to geoarchaeology. Includes sections on: Geoarchaeological foundations; Alluvial environments; Eolian environments; Springs, lakes, rockshelters, and other terrestrial environments; Coastal environments; The postburial disturbance of archaeological site context; and case studies from different landscape contexts.]

Non-Archaeological Texts with Geoarchaeological Applications:

Birkeland, Peter W.

1984 *Soils and Geomorphology*. Oxford University Press.

[Slightly dated, but still a useful and in-depth text on soils. Includes sections on: The soil profile, horizon nomenclature, and soil characteristics; Soil classification; Weathering processes; The products of weathering; Processes responsible for the development of soil profiles; Factors of soil formation; Influence of parent material on weathering and soil formation; Weathering and soil development through time; Topography-soil relationships; Vegetation-soil relationships; Climate-soil relationships; Application of soils to geomorphological studies; Data necessary for describing a soil profile; Climate conditions in the United States.]

Brady, Nyle C. and Ray R. Weil

- 2002 *The Nature and Properties of Soils (13th Edition)*. Prentice Hall, New Jersey.
[Detailed and well-illustrated upper-level text on soils. Includes sections on soils from many different perspectives (geological, taxonomic, engineering, agriculture, etc.)]

Jenny, Hans

- 1941 *Factors of Soil Formation: A System of Quantitative Pedology*. McGraw-Hill, New York.
[Quite dated now, of course, this volume was precedence setting and "set the stage" for much of modern soil science. Still fun and useful reading for background on the "clorpt" equation. Has been re-printed as a Dover Thrift Edition with a new forward by Ronald Amundson. For an updated discussion of Jenny's five factors, see Birkeland 1984.]

Milne, J.D.G., B. Clayden, P.L. Singleton and A.D. Wilson

- 1995 *Soil Description Handbook*. Manaaki Whenua Press, New Zealand.
[Detailed volume of soil description, note that terminology, size grading, etc. are specific to New Zealand and are quite different from U.S. standards.]

Neuendorf, Klaus K.E., James P. Mehl Jr. and Julia A. Jackson (editors)

- 2005 *Glossary of Geology, 5th Edition*. American Geological Institute, Washington, D.C.
[Detailed glossary with background information for many of the terms. Available as an on-line, searchable database (for a subscription fee) here: <http://www.agiweb.org/pubs/glossary/#>.]

Retallack, Gregory J.

- 2001 *Soils of the Past: An Introduction to Paleopedology*. Blackwell Science Ltd., Oxford.
[Detailed guide to paleosols. Deals with pre-Quaternary as well as Quaternary soils.]

Schoeneberger, P.J., D.A. Wysocki, E.C. Benham, and W.D. Broderson (editors)

- 2002 *Field Book for Describing and Sampling Soils, Version 2.0*. Natural Resources Conservation Service, National Soil Survey Center, Lincoln, NE.
[Very detailed guide to NRCS soil description standards. Available from the NRCS in a weatherproof, binder-style format. Can be downloaded for free in PDF format here: <http://soils.usda.gov/technical/fieldbook/>]

Soil Science Society of America

- 2001 *Glossary of Soil Science Terms*. Soil Science Society of America, Madison, WI.
[Detailed glossary of soil terminology, includes descriptions and definitions of soil horizons and other useful information. Available on-line in a searchable format here: <http://www.soils.org/sssagloss/>. There is

also a downloadable custom spelling file available at this site, compatible with Microsoft Word. Handy if you can't remember how to spell Quartzipsamments.]

Soil Survey Staff

- 1999 *Soil Taxonomy (2nd Edition)*. United States Department of Agriculture Natural Resources Conservation Service, Agricultural Handbook Number 436.
[The 'Bible' of soil taxonomy – not directly applicable to geoarchaeology but worth understanding for general soils background. Has very detailed and official USDA definitions of soil horizon nomenclature.]

Useful Articles on Bioturbation:

Balek, Cynthia L.

- 2002 Buried Artifacts in Stable Upland Sites and the role of Bioturbation: A Review. *Geoarchaeology* 17:41-51.
[Nice current overview of bioturbation in upland settings.]

Johnson, Donald L.

- 1989 Subsurface Stone Lines, Stone Zones, Artifact-Manuport Layers, and Biomantles Produced by Bioturbation Via Pocket Gophers (*Thomomys bottae*). *American Antiquity* 54:370-389.
[Slightly dated but a nice overview of bioturbation and stone zone formation.]

Johnson, Donald L.

- 2002 Darwin Would be Proud: Bioturbation, Dynamic Denudation, and the Power of Theory in Science. *Geoarchaeology* 17:7-40.
[Nice overview of recent thought on bioturbation etc., and demonstration of the importance of theoretical point-of-view.]

Morin, Eugene

- 2006 Beyond Stratigraphic Noise: Unraveling the Evolution of Stratified Assemblages in Faunal-turbated Sites. *Geoarchaeology* 21:541-565.
[Nice discussion of the role of depth-distribution analysis in interpreting sites.]

Schaetzl, Randall J. and Leon R. Follmer

- 1990 Longevity of Treethrow Microstratigraphy: Implications for Mass Wasting. *Geomorphology* 3:113-123.
[Demonstrates that the "pit and mound" topography from tree-throws can last 1,000 years or more. Interesting to think about in the context of buried horizons – many "shallow ephemeral features" could be caused by these factors.]

Van Nest, Julieann

- 2002 The Good Earthworm: How Natural Processes Preserve Upland Archaic Archaeological Sites of Western Illinois, U.S.A. *Geoarchaeology* 17:53-90.
[Nice piece on bioturbation actually helping to preserve sites, with a discussion of the implications of the vertical distributions of artifacts vs. natural clasts.]

Useful Articles Dealing With Soils, Sediments, and Landforms:

Conacher, A.J. and Dalrymple, J.B.

- 1977 The Nine-Unit Landsurface Model: An Approach to Pedogeomorphic Research. *Geoderma* 18:1-154.
[Slightly dated, but this article describes a hill-slope/landsurface model still used fairly often today.]

Ferring, C. Reid

- 1986 Rates of Fluvial Sedimentation: Implications for Archaeological Variability. *Geoarchaeology* 1:259-274.
[Classic article on rates of sedimentation and the preservation and stratification of archaeological sites. Great demonstration that the simplest ideas are usually the more powerful ones.]

Landa, Edward R. and Mark D. Fairchild

- 2005 Charting Color from the Eye of the Beholder. *American Scientist* 93(5):436-443.
[More for fun than anything else – gives the background of Albert Henry Munsell, his development of the soil color charts, and their current uses.]

McPherron, Shannon J.P., Harold L. Dibble and Paul Goldberg

- 2005 Z. *Geoarchaeology* 20:243-262.
[Nice piece demonstrating the usefulness of the high-accuracy plotting of artifacts, particularly with regards to elevation (Z).]

Phillips, Jonathan A. and Daniel A. Marion

- 2005 Biomechanical Effects, Lithological Variations, and Local Pedodiversity in Some Forest Soils of Arkansas. *Geoderma* 12(73-89).
[Nice overview and demonstration that soils can be highly variable over short distances – outlines many of the reasons this can be the case. This article is specific to the Ouachita Mountain region of Arkansas, but the same factors apply elsewhere, to a greater or lesser degree.]

Phillips, Jonathan A., Daniel A. Marion, Kenneth Luckow, and Kristin R. Adams

- 2005 Nonequilibrium Regolith Thickness in the Ouachita Mountains. *The Journal of Geology*:113(325-340).

[Nice demonstration and overview of the potential variation in soil thickness. Specific to the Arkansas Ouachita Mountains, but note that the same processes may apply elsewhere.]

Thorson, Robert M.

1996 The Five-Square Strategy for Excavating Colluvial Slopes. *The Review of Archaeology* 17:25-32.

[Very practical piece on understanding slope movement and its archaeological implications through test units. Even includes short section on recommended field procedures.]