

BIOSYSTEMS ANALYSIS, INC.

ARCHAEOLOGICAL  
LABORATORY  
SERVICES



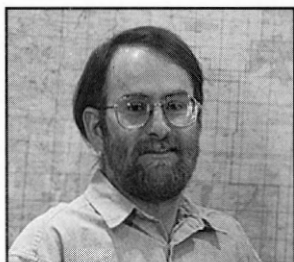
BIOSYSTEMS ANALYSIS, INC.

303 POTRERO STREET, SUITE 29-101  
SANTA CRUZ, CA 95060

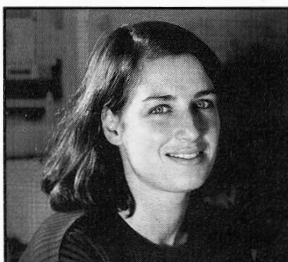
(408) 459-9100

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email: Obsidian@BioSysSC.MHS.  
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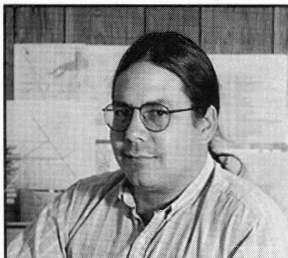
**Craig Skinner**, Obsidian Studies Program Director, has been involved in obsidian and volcanic tephra characterization research since 1980 and has worked extensively with glasses from the western U.S. and elsewhere. He is past-president of the International Association for Obsidian Studies and he is coauthor of *Obsidian: An Interdisciplinary Bibliography*, now an Internet database.



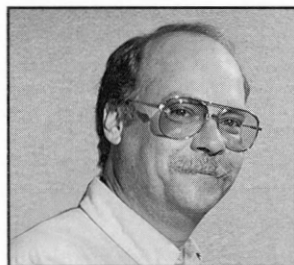
**M. Kathleen Davis** is an X-ray fluorescence analyst with experience in obsidian and basalt characterization in the western U.S., Alaska, Hawai'i, and Central America. She has been trained in X-ray fluorescence spectroscopy at UC Berkeley and at Spectrace Instruments in Colorado.



**Jennifer Farquhar**, Laboratory Director, has worked with artifact collections from California, Mexico, and Hawai'i. She has field survey and excavation experience in California, Mexico, and Belize.



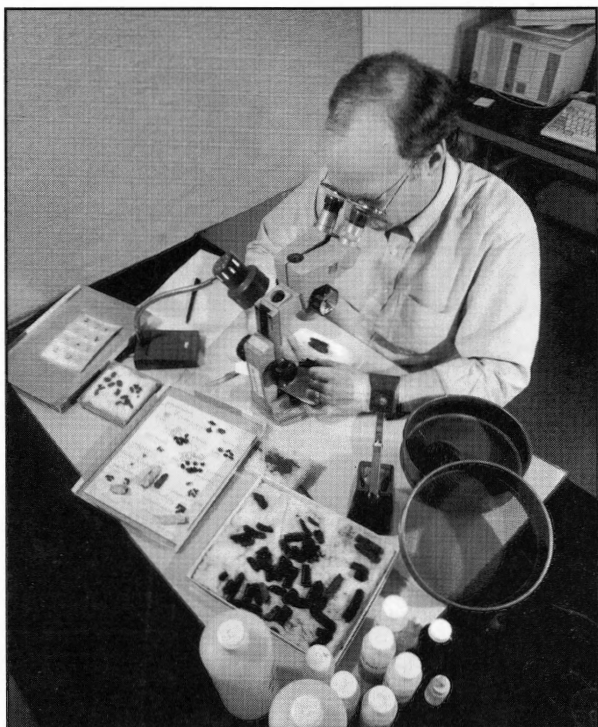
**Jeffrey Hall** specializes in human osteology and vertebrate faunal analysis. With 17 years of field and laboratory experience in California archaeology, he has worked in the North Coast ranges, all parts of the Sierra Nevada, the Central Coast, and the southern Great Basin and northern Mojave Desert.



**Charles Miksicek** is an internationally known archaeobotanist who has spent twenty years analyzing and reporting on plant remains from prehistoric and historic sites in California, the American Southwest, South and Central America, and Mediterranean Europe.

**Tim Denham** specializes in geoarchaeology and paleo-environmental reconstruction. He has interpreted complex stratigraphic sequences at littoral sites throughout the Hawaiian archipelago.

**Tad E. Allred** is an obsidian hydration specialist with archaeological experience in California, Oregon, and the Great Basin. He oversees slide preparation and hydration rim measurement.



*Microscopic identification of charred plant remains from southern Arizona.*

## ARCHAEOLOGICAL LABORATORY SERVICES

X-ray fluorescence trace  
element characterization

Obsidian hydration  
analysis

Obsidian source studies

Archaeobotany

Faunal analysis

Paleoenvironmental  
coring

Computerized artifact  
cataloging

Artifact and materials  
identification

Preparation for  
curation facility

## CULTURAL RESOURCES MANAGEMENT CAPABILITIES

BioSystems' Cultural Resource Division combines experienced individuals with unique laboratory and field capabilities to produce high-quality work in the management of cultural resources throughout California, Hawai'i, and the western United States. We specialize in prehistoric archaeology; historic archaeology; ethnography; history; archaeobotany; obsidian hydration dating; and obsidian, basalt, and vitric tuff characterization.

BioSystems' Santa Cruz, Sacramento, and Hawai'i offices all support field investigations. All three

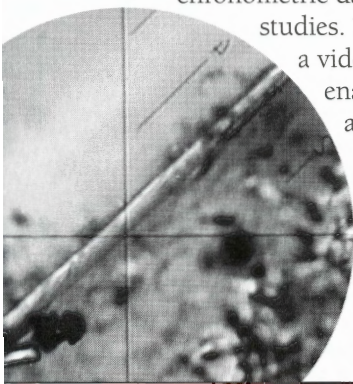


offices have fully equipped laboratory facilities for processing materials recovered in the field. Comprehensive reports are prepared by our production staff, who have expertise in word processing, graphics, GIS, and database management.

*Geochemical analysis of artifacts using X-ray fluorescence.*

## OBSIDIAN HYDRATION ANALYSIS

By removing a small thin section from obsidian artifacts, laboratory technicians are able to measure hydration rims on the artifacts, providing valuable chronometric data for archaeological studies. The lab is equipped with a video microscopy system, enabling technicians to accurately measure and process large quantities of specimens.



*Thin section of an obsidian artifact under magnification; the band in the middle is the hydration rind.*



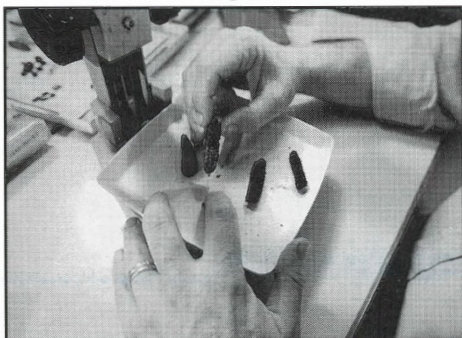
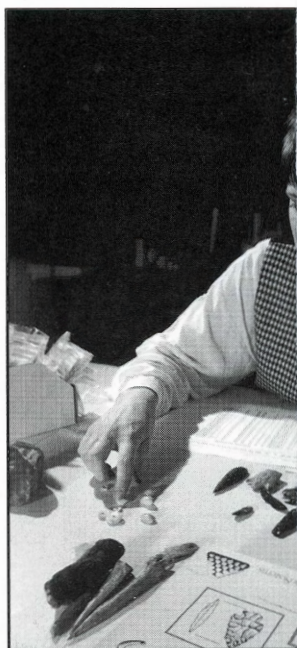
## X-RAY FLUORESCENCE TRACE ELEMENT CHARACTERIZATION

BioSystems owns and operates a Spectrace 5000 energy-dispersive X-ray fluorescence spectrometer that is used to determine the trace and minor element composition of archaeological and geological specimens. We maintain an extensive database of geochemical trace element signatures for obsidian sources from the western U.S., Alaska, and parts of Central America. We also offer analysis of basalt, vitric tuff, and volcanic tephra, and we are currently assembling basalt quarry databases for the northern Sierra Nevada and the Hawaiian Islands.

All types of XRF analyses are non-destructive. Normal turnaround for both X-ray fluorescence and obsidian hydration analysis is six weeks or less, with faster turnaround available at an extra charge.

### OBSIDIAN SOURCE STUDIES

An understanding of the geographic distribution of obsidian sources is a fundamental component of obsidian procurement investigations. BioSystems performs geochemical and geoarchaeological studies and inventories of sources or source regions.



*600-year-old  
corn cobs from  
northern  
Arizona.*

## ARCHAEOBOTANY

We are among the leaders in the art and science of recovering, identifying, and interpreting plant remains from archaeological sites. Our laboratory offers both flotation sample analysis and macrobotanical identifications (seeds, charcoal, and radiocarbon sample identifications).



BioSystems routinely offers wood charcoal identifications for California and the desert regions of the southwest. We maintain an extensive comparative collection of seed and wood types for California and the greater southwest (Utah, Colorado, Arizona, New Mexico, and northern Mexico), and we can analyze or identify plant remains from other regions on request.



*Typological  
analysis of artifacts  
from central California.*

## FAUNAL ANALYSIS

We offer identification and analysis of bird and mammal bones or bone artifacts from archaeological sites. Our services include preliminary sorting, taxonomic identification, quantification of data, and summary reporting. BioSystems can also arrange for identification and analysis of marine shell and fish remains. We encourage and will provide full integration of faunal data with other information sources in your reports.



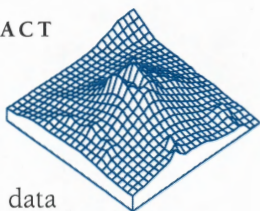
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## PALEOENVIRONMENTAL CORING

BioSystems' Kailua, Hawai'i, office is equipped with a coring unit, providing an economical and efficient method for the manual recovery of undisturbed soil and sediment samples. The coring unit is deployed for research in a wide range of environments, e.g., marshes, lakes, estuaries, mud flats, fishponds, and taro fields. Collected samples are subject to a variety of analyses—sedimentological, palynological, macrobotanical, malacological, and diatom—to facilitate paleoenvironmental reconstruction in a variety of locales, such as fishponds, wetlands, or irrigated agricultural systems.

## COMPUTERIZED ARTIFACT CATALOGING

All laboratories are fully computerized. Databases may be customized to meet specific cataloging and data analysis requirements. Stored data can be depicted graphically, as in this digital elevation map.



## LABORATORY FACILITIES AND EQUIPMENT

Our Santa Cruz office has a 4,000-sq.-ft. archaeological laboratory that houses an archaeobotanical laboratory, an X-ray fluorescence spectrometer for geochemical characterization studies, and a 2,500-volume archaeology library. Our Sacramento office has a 6,000-sq.-ft. laboratory with a fully equipped

obsidian hydration dating laboratory. Our Hawai'i office has an archaeological and sedimentary laboratory. All three labs are equipped for interim curation of archaeological collections in secure facilities; long-term curation is also available.



*Emission spectrum generated during XRF analysis of an obsidian artifact.*





## BIOSYSTEMS ANALYSIS, INC

(408) 459-9100

Obsidian@BioSysSC.MHS.CompuServe.com

### OBSIDIAN STUDIES

XRF analysis and source identification (*per sample*) ..... \$23

Obsidian hydration analysis (*per sample*) ..... \$12

Additional hydration measurements ..... \$ 7

Optional handling fee for overnight mail ..... \$20

Surcharge for rapid turnaround service (*Call first*) ..... Add 20%

Discount for single orders > 100 samples ..... Subtract 5%

Obsidian source studies ..... Call for estimate

### FAUNAL ANALYSIS LABORATORY SERVICES

Charges based on scope of requested services.  
Please call for estimates.

### PALEOENVIRONMENTAL CORING

Charges based on scope of requested services.  
Please call (808) 261-4300 for estimates.





**BIOSYSTEMS ANALYSIS, INC.**  
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*Printed with soy ink on recycled paper*

