



FEDERACION
ARGENTINA
de ESPELEOLOGIA

"2 de Abril, Día del Veterano de Guerra de las
Islas Malvinas e Islas del Atlántico Sur"

RESOLUCIÓN Nº 241 . . . 12.-
NEUQUÉN, 18 ABR 2012

VISTO:

El Expediente Nº 4350-00015/12 del registro de la Dirección Provincial de Recursos Naturales, dependiente de la Coordinación General del Ministerio de Desarrollo Territorial, caratulado: "Permiso de Investigación Dr. George BROOK, Dataciones paleoclimáticas para el centro oeste de la Argentina en estalagmitas de las cuevas de Cuchillo Curá Nqn"; y

CONSIDERANDO:

Que el Director General de Control de los Recursos Faunísticos y Áreas Naturales Protegidas, solicita que por la vía que corresponda, se le otorgue al Dr. en Geografía George A. BROOK, el permiso correspondiente para ingresar al área natural protegida Cuchillo Curá, con el objetivo de realizar en jurisdicción de la mencionada área, el proyecto de investigación científico denominado: "Dataciones Paleoclimáticas para el centro-oeste de la Argentina en estalagmitas de las cuevas Cuchillo Curá, Neuquén";

Que conforme el dictamen producido por el equipo técnico de Áreas Naturales Protegidas a fojas 02 y 03 del Expediente del visto, el trabajo de investigación que realizará el profesional, permitirá estudiar el paleoclima de la Provincia del Neuquén mediante el examen de las estalagmitas como parte de un estudio mas amplio que busca obtener el primer registro de alta resolución del cambio climático en diversos ámbitos de Argentina en los últimos 130.000 años;

Que las actividades de investigación propuestas, se enmarcan en los objetivos de conservación establecidos por el Artículo 3º, apartado b) de la Ley 2594, por lo que corresponde otorgar el permiso solicitado;

Que en base a las facultades emergentes del Artículo 6º, inciso f) del la Ley Provincial 2594, corresponde emitir la Norma Legal respectiva;

Por ello,

**EL MINISTRO DE DESARROLLO TERRITORIAL
RESUELVE:**

Artículo 1º: AUTORIZÁSE al Doctor en Geografía Señor George BROOK, Pasaporte Nº 210.569.040, a realizar en jurisdicción del Área Natural Protegida Cuchillo Curá, el proyecto de investigación científica denominado: "Dataciones Paleoclimáticas para el centro-oeste de la Argentina en estalagmitas de las cuevas Cuchillo Curá, Neuquén".-

Artículo 2º: DETERMÍNASE que la presente autorización tendrá vigencia por el término de un (1) año contado a partir de la fecha de notificación de la presente.-

Artículo 3º: ESTABLÉZCASE que la persona autorizada en el artículo 1º deberá, una vez vencido el plazo del establecido en el Artículo 2º, presentar ante la Dirección General de Control de los Recursos Faunísticos y Áreas Naturales Protegidas, el informe final de la investigación llevada a cabo en original y copia.-

Artículo 4º: NOTIFIQUESE al interesado a través de la Dirección General de Control de los Recursos Faunísticos y Áreas Naturales Protegidas

Artículo 5º: Regístrese, comuníquese y cumplido, archívese.-



DR. MARIA MERCEDES BERTHOYA
Coordinadora Administrativa
Ministerio de Desarrollo Territorial

FIRMADO: BERTOYA

HIGH-RESOLUTION PALEOCLIMATIC RECORDS FROM STALAGMITES IN ARGENTINE CAVES

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University of Georgia
Athens GA 30602
USA

Introduction

Stalagmites are now a major source of high-resolution climate data for many regions of the world where caves occur. They can be dated by U-series methods so accurately that stalagmite age data are being used to correct ice core and ocean core chronologies and calibrate radiocarbon ages. Stalagmites can provide color, UV-induced luminescence, and oxygen and carbon isotope data at decadal, annual, and even sub-annual scales. In addition, petrographic information can be obtained from thin section studies. These climate proxies can provide a great deal of information about past climate conditions of use is assessing the impact of changing climates on human activities, and the possible impacts of global warming in particular areas.

Although there have been detailed studies of stalagmites in many areas of the world, such as China, there have been very few in South America and, so far, none in Argentina. There has been one study of stalagmites in Brazil that appeared in Science. We propose to examine stalagmites from several areas of Argentina along transects running North-South and West-East through the country. We will extract information on past climate change from the stalagmites we study.

Objectives

The main aim of the proposed research is to produce the first high-resolution record of climate change for several areas of Argentina for the last 130,000 years. This record will help us to understand how climate affected Argentina during both glacial and interglacial times, as well as during more recent periods such as the Little Ice Age (LIA), Medieval Climate Anomaly (MCA), and Younger Dryas (YD). In particular, data for the last 15,000 years will be of great use to archaeologists studying the first humans to enter Argentina and how they adapted to climate changes. Currently, there is no continuous record of climate change for this period so it is difficult to know if harsh climate conditions can explain periods with little evidence of human occupation.

Materials and Methods

To complete the work proposed we will need to remove selected stalagmites from caves in different parts of Argentina. Every effort will be made to minimize the impact of this activity on the caves examined by choosing sites away from the main tourist or caving routes. In Conservation Areas stalagmites will be selected for removal in consultation with officials and will only be removed with their permission.

In the laboratory the stalagmites collected will be cut along the central growth axis (along their length). One surface will be scanned to record color, and then it will be subjected to UV light in a dark room and the resulting luminescence recorded with a digital camera equipped with the necessary filters. Samples will be drilled from one half of the stalagmite for O-18 and C-13 isotope analysis and for U-series dating. Finally, this half will also be used to prepare thin sections for petrographic studies of the stalagmite carbonate. All results will be combined to produce a record of climate change in the area over the period represented by the stalagmite. If possible (depending on size) one half of the stalagmite will be archived to preserve the record contained.

A final report on the research will be submitted to Conservation Area authorities for their information and use. Research results will be presented at conferences in Argentina and at international conferences elsewhere, and published in Argentine and international journals. Where tourist caves are studied, information suitable for display will be provided to the cave authorities.

Area of Study

Areas of study will be determined by the occurrence of caves and will be determined in consultation with members of the Argentina Speleological Association. We hope to study stalagmites in caves along N-S and W-E transects to

determine how past climates varied with latitude and longitude. In the first stage of the work we hope to examine caves in Mendoza and Neuquén and in particular the Las Brujas and Cuchillo Cura caves.

Period of Study

The study is likely to be for 5 years with the initial period of work in Mendoza and Neuquén lasting from 2009-2011.

Justification for Working in Conservation Areas

In many parts of Argentina there are few caves that contain stalagmites. As caves are rare in many parts they are often Conservation Areas. With so few caves, there is often little choice about where to do the work and as a result it is often necessary to work in protected caves such as Las Brujas and Cuchillo Cura.

Conservation Issues

Stalagmites are such a valuable paleoclimate resource that it is essential that they are studied. However, to study stalagmites they must be removed from caves and so this form of research does lead to some damage to the cave environment. The impact of this damage can be minimized by selecting stalagmites in remote parts of caves and only removing a very few deposits. We do everything we can in our research to minimize damage and have even developed a drilling device that can drill vertical cores from large stalagmites so as to access the data they contain without much damage to the cave. However, with smaller stalagmites they must be removed for study.

This is one area where conservation and science must both be considered. We plan to remove only stalagmites suitable for our research and in conservation areas only with the permission of the local authorities. Damage will be minimal and the scientific benefits considerable.

Budget

All field and scientific costs of the research proposed will be covered by NSF and other grants to Brook and by support he is given by the University of Georgia. It is expected that the cost of the proposed research will exceed US \$30,000.

Published Paleoenvironmental Research by Brook Since 1999 (cave studies in red)

- Brook, G. A., Marais, E., Cowart, J. B. (1999). Evidence of wetter and drier conditions in Namibia from tufas and submerged speleothems. *Cimbebasia* 15: 29-39.
- Brook, G. A., Rafter, M. A., Railsback, L. B., Sheen, S-W., Lundberg, J. (1999). A high-resolution proxy record of rainfall and ENSO since A.D. 1550 from layering in stalagmites from Anjohibe Cave, Madagascar. *The Holocene*, 9 (6): 695-705.
- Railsback, L.B., Brook, G.A., Webster, J.W. (1999). Petrology and paleoenvironmental significance of detrital sand and silt in a stalagmite from Drotsky's Cave, Botswana. *Physical Geography* 20 (4): 331-347.
- Brook, G.A., Sheen, S.-W. (1999). Cyclicity in precipitation and stream discharge in Georgia and relationships with the Southern Oscillation. *Physical Geography* 20(5): 367-393.
- Brook, G.A., Sheen, S.-W. (2000). Rainfall in Oman and the United Arab Emirates: Cyclicity, influence of the Southern Oscillation, and what the future may hold. *The Arab World Geographer* 3(2): 78-96.
- Robbins, L.H., Murphy, M.L., Brook, G.A., Ivester, A.H., Campbell, A.C., Klein, R.G., Milo, R.G., Stewart, K.M., Downey, W.S., Stevens, N.J. (2000). Archaeology, paleoenvironment and chronology of the Tsodilo Hills White Paintings Rock Shelter, northwest Kalahari Desert, Botswana. *Journal of Archaeological Science* 27: 1085-1113.
- Robbins, L.H., Murphy, M.L., Brook, G.A., Campbell, A.C., Melear, N., Downey, W.S. (2001). Late Quaternary archaeological and paleoenvironmental data from sediments at Rhino Cave, Tsodilo Hills. *South African Field Archaeology* 9: 17-31.
- Brook, G.A., Embabi, N. S., Ashour, M. M., Edwards, R. L., Cheng, H., Cowart, J. B., Dabous, A. A. (2002). Djara Cave in the Western Desert of Egypt: Morphology and evidence of Quaternary climatic change. *Cave and Karst Science* 29 (2): 57-66.

- Thomas, D., Brook, G., Shaw, P., Bateman, M., Haberyan, K., Appleton, C., Nash, D., McLaren, S., Davies, F. (2003). Late Pleistocene wetting and drying in the NW Kalahari: An integrated study from the Tsodilo Hills, Botswana. *Quaternary International* 104: 53-67.
- Brook, G.A., Embabi, N. S., Ashour, M. M., Edwards, R. L., Cheng, H., Cowart, J. B., Dabous, A. A. (2003). Quaternary environmental change in the Western Desert of Egypt: Evidence from cave speleothems, spring tufas, and playa sediments. *Zeitschrift für Geomorphologie Suppl.-Vol.* 131: 59-87.
- Brook, G.A., Robbins, L.H., Campbell, A.C. (2003). Forty thousand years of environmental change in the Kalahari as evidenced by sediments in the Depression Rock Shelter, Tsodilo Hills, Botswana. *Nyame Akume* 59: 2-10.
- Thomas, D., Brook, G., Shaw, P., Bateman, M., Haberyan, K., Appleton, C., Nash, D., McLaren, S., Davies, F. (2003). Late Pleistocene Wetting and Drying in the NW Kalahari: An Integrated Study from the Tsodilo Hills, Botswana. *Quaternary International* 104: 53-67.
- Leigh, D.S., Srivastava, P., Brook, G.A. (2004). Late Pleistocene braided rivers on the Southeastern Atlantic Coastal Plain, U.S.A. *Quaternary Science Reviews* 23: 65-84.
- Srivastava, P., Brook, G.A., Marais, E. (2004). A record of fluvial aggradation in the northern Namib Desert during the Late Quaternary. *Zeitschrift für Geomorphologie N.F., Suppl.-Vol.* 133: 1-18.
- Scott, L., Marais, E., Brook, G.A. (2004). Fossil hyrax dung and evidence of Late Pleistocene and Holocene Vegetation types in the Namib Desert. *Journal of Quaternary Science* 19: 4p.
- Srivastava, P., Brook, G.A., Marais, E. (2005). Depositional environment and luminescence chronology of the Hoarusib River Clay Castles sediments, northern Namib Desert, Namibia. *Catena* 59: 187-204.
- Brook, G.A., Srivastava, P., Marais, E. (2006). Characteristics and OSL minimum ages of relict fluvial deposits near Sossus Vlei, Tsauchab River, Namibia, and a regional climate record for the last 30 ka. *Journal of Quaternary Science* 21: 347-362.
- Srivastava, P., Brook, G.A., Marais, E., Morthekai, P., Singhvi, A.K. (2006). Depositional environment and OSL chronology of the Homeb Silt deposits, Kuiseb River, Namibia. *Quaternary Research* 65: 478-491.
- Brook, G.A., Ellwood, B.B., Railsback, L.B., Cowart, J.B. (2006). A 164 ka record of environmental change in the American Southwest from a Carlsbad Cavern speleothem. *Palaeogeography, Palaeoclimatology, Palaeoecology* 237: 483-507.
- Gil-Romero, G., Scott, L., Marais, E., Brook, G.A. (2006). Middle- to late-Holocene moisture changes in the desert of northwest Namibia derived from fossil hyrax dung pollen. *The Holocene* 16: 1079-1090.
- Gil-Romera, G., Scott, L., Marais, E., Brook, G.A. (2007). Late Holocene environmental change in the North-western Namib Desert margin: new fossil pollen evidence from hyrax middens. *Palaeogeography, Palaeoclimatology, Palaeoecology* 249: 1-17.
- Webster, J.W., Brook, G.A., Railsback, L.B., Cheng, H., Edwards, R.L., Alexander, C., Reeder, P.P. (2007). Stalagmite Evidence from Belize indicating significant droughts at the time of Preclassic Abandonment, the Maya Hiatus, and the Classic Maya Collapse. *Palaeogeography, Palaeoclimatology, Palaeoecology* 250:1-17.
- Brook, G.A., Marais, E., Srivastava, P., Jordan, T. (2007). Timing of lake level changes in Etosha Pan, Namibia, since the middle Holocene from OSL ages of relict shorelines in the Okondeka region. *Quaternary International* 175: 29-40.
- Moyes, H., Awe, J., Brook, G.A., Webster, J. (2009). The ancient Maya drought cult: Late Classic cave use in Belize. *Latin American Antiquity* (in press).
- De Waele, J., Brook, G. A., Oertel, A. 2009. Monk seal (*Monachus Monachus*) bones in Bel Torrente Cave (Central-east Sardinia) and their peleo-geographical significance. *Journal of Cave and Karst Studies* (in press).
- Robbins, L.H., Campbell, A. C., Murphy, M. L., Brook, G. A., Mabuse, A. A., Hitchcock, R., Babutsi, G., Mmolawa, M., Stewart, K.M., Steele, T. E., Klein, R. G., Appleton, C. C., 2009. Mogapelwa: Archaeology, Paleoenvironment and Oral Traditions at Lake Ngami, Botswana. *South African Archaeological Bulletin* (accepted).
- LaMoreaux, H.K., Brook, G.A., Knox, J. A., 2009. Late Pleistocene and Holocene environments of the Southeastern USA from the stratigraphy and pollen content of a peat deposit on the Georgia Coastal Plain. *Palaeogeography, Palaeoclimatology, Palaeoecology* (accepted with revisions).
- Brook, G.A. 2009. Radiocarbon ages for coatings in cupules ground in quartzite bedrock at Rhino Cave in the Kalahari Desert of Botswana, and their paleoclimatic significance. *Geochronology: An International Journal* (accepted with revisions).
- Yu, K. B., Brook, G. A., Rhew, H., Shin, Y. H., Kim, S., Brook, F. Z., 2009. Episodic coastal dune development in the Taean Peninsula and Anmyeon Island, Korea, during the mid to late Holocene (accepted).
- Markewich, H.W., Litwin, R.J., Pavich, M.J., Brook, G.A., 2009. Late Pleistocene eolian features in southeastern Maryland and the Chesapeake Bay region— Evidence for strong WNW-NW winds accompanying growth of Laurentide Ice-Sheet (in press).

CURRICULUM VITAE

GEORGE ALBERT BROOK

December 20, 2011

1. PERSONAL DATA

Place of Birth: Sunderland, England
Nationality: United States Citizen
Address: Department of Geography
University of Georgia
Athens GA 30602, U.S.A.

2. PRESENT POSITION

Merle C. Prunty Professor of Geography (2001-), and Director, University of Georgia Luminescence Dating Laboratory (2001-). Appointed to Graduate Faculty November 1978. Granted Tenure September 1981.

3. FORMER POSITIONS AT UGA

Assistant Head, Department of Geography, May-August 1993
Acting Head, Department of Geography, 1993-94
Head, Department of Geography 1994-99
Director, Center for Archaeological Sciences, University of Georgia, 1994-2005
Head, Department of Geography, Jan 2006-June 2011

3. UNIVERSITIES ATTENDED AND ACADEMIC RECORD

Edinburgh University, Edinburgh, Scotland. B.Sc. Geography 1967, awarded First Class Honors.
University of the Witwatersrand, Johannesburg, South Africa. M.Sc. Geography 1970. Dissertation: "An Investigation Into the Origin and Evolution of Two Inselberg Landscapes in the Transvaal," 139 pp.
McMaster University, Hamilton, Ontario, Canada. Ph.D. Geography 1976. Dissertation: "Geomorphology of the North Karst, South Nahanni River Region, Northwest Territories, Canada," 627 pp.

4. HONORS

1967 Awarded First Class Honors B.Sc.
1967 Leverhulme Award (for performance in B.Sc. final examinations).
1971 South African Geographical Society Medal for the outstanding Master's thesis of the year.
1973-75 National Research Council of Canada Postgraduate Scholarship
1974 Distinction in Ph.D. Comprehensive Examinations
1983 University of Georgia M.G. Michael Award for Excellence in Research (\$2,000 cash award)
1987-88 Africa Regional Research Fulbright Senior Scholar Award to undertake 9 months of research in Botswana, Zambia, Zimbabwe, Zaire, and Kenya. Cooperative research and affiliations were as follows: **Botswana** - Affiliation with the Department of Earth Sciences, University of Botswana, Gaborone; **Zambia** - Research Affiliate of the Department of Geography, University of Zambia, Lusaka; **Zimbabwe** - Fulbright Research Associate in the Department of Geology, University of Zimbabwe, Harare. Cooperative research with the Zimbabwe Department of National Parks and Wildlife Management; **Zaire** - Member of the Semliki Research Expedition headed by Noel T. Boaz, Director of the Virginia Museum of Natural History, Martinsville, VA. Cooperative research with the Institut Zairois Pour la Conservation de la Nature; **Kenya** - Affiliation with the National Museums of Kenya (Director R.E. Leakey). Cooperative research with the Caving Group of East Africa.
1988 Resource advisor for countries in eastern and southern Africa, Fulbright Program for Africa, Pre-Departure Conference, June 28-July 1, 1988, Washington, D.C. (\$700 honorarium from the U.S. Information Agency).
1990 Chairman of the Working Group "Desert Paleoenvironments from Cave Sediments" within UNESCO's International Geological Correlation Program 252 "Past and Future Evolution of Deserts."
1990 Chairman of Working Group "Paleoenvironments of Presently Arid Karst Areas" within IGU Study Group "Anthropogenic Impact and Environmental Changes in Karst."

- 1991 "Study in a Second Discipline," University Faculty Development Award, University of Georgia (\$15,000 to Department of Geography).
- 1996-01 One of 11 Full Members of International Geographical Union Commission 96.C21 "Sustainable Development and Management of Karst Terrains."
- 1997-02 Co-leader of the "Hydrological Dynamics" working group within the UNESCO IGCP 413 "Future Dryland Environmental Change from Past Dynamics."
- 1998 Visiting Professor, Department of Geography, Ain Shams University, Cairo, Egypt, Feb. 28-March 16 (\$2,000 travel).
- 1998 University System of Georgia Chancellor's Award (\$1,500) for "China 1998 Faculty Development Seminar", Nanjing, China, July 1-July 30.
- 1999 Awarded prize of \$500 by the Editorial Board of *Physical Geography* for "Cyclicality in precipitation and stream discharge in Georgia and relationships with the Southern Oscillation", judged as one of the four best papers presented at the Association of American Geographers ENSO symposium in Hawaii, March 1999.
- 2001-02 University Partnership Program, Binational Fulbright Commission Visiting Professor, Ain Shams University, Cairo, Egypt, 3 weeks in March 2001 and 3 weeks in March 2002.
- 2001 Appointed Merle C. Prunty Jr. Professor of Geography, January 2001.
- 2005- U.S. Member of IGU Commission C0402-Arid Land, Humankind and Environment.
- 2007 Visiting Professor, Department of Geography, Ain Shams University, Cairo, Egypt, April 12-22 (\$2,000 travel).
- 2008 G. K. Gilbert Award for Excellence in Geomorphological Research (with D. S. Leigh and P. Srivastava) for paper "Late Pleistocene braided rivers on the Southeastern Atlantic Coastal Plain, U.S.A.", *Quaternary Science Reviews* 23: 65-84, 2004.
- 2009 Member of the Core Committee of the Third LIMPACS (IGBP, PAGES) Conference, Chandigarh, India, March 5-8.
- 2010 Voted an honorary member of the Federación Argentina de Espeleología (Argentine Federation of Speleology), November, 2010.

5. RESEARCH INTERESTS, FIELD EXPERIENCE AND TRAVEL

Research Interests:

- 1) Quaternary climate change, 2) Geoarchaeology, 3) Arid lands, 4) Karst.

Field Experience:

Extensive fieldwork in Argentina, Belize, Canada, the U.S.A., Mexico, South Africa, Botswana, Namibia, Zimbabwe, Zambia, Zaire, Kenya, Somalia, Turkey, Oman, Egypt, Madagascar and China.

Travel:

Travel in 15 African countries (Egypt, Somalia, Botswana, Namibia, Zambia, Zaire, Rwanda, Tanzania, Kenya, Malawi, Zimbabwe, Swaziland, Lesotho, South Africa, Madagascar, and Mozambique), 7 countries in the Americas and Caribbean (Argentina, Belize, Brazil, Mexico, U.S.A., Canada, Jamaica, Puerto Rico), 18 European countries (U.K., Portugal, Spain, France, Monaco, Luxembourg, Italy, Switzerland, Austria, Germany, Holland, Belgium, Slovenia, Croatia, Greece, Hungary, Czech Republic, Slovakia, and Turkey), 3 countries in Arabia (United Arab Emirates, Oman, Saudi Arabia), and 5 countries in E. and SE Asia and the Pacific (Australia, India, Singapore, Malaysia, China).

6. INTERNATIONAL COLLABORATIVE AGREEMENTS DEVELOPED

1. Department of Geography, University of Georgia and the Department of Geography at Ain Shams University, Cairo, Egypt, 2000-2005, renewed in 2005 for a further five years and currently being renewed again.
2. Center for Applied Isotope Studies and Luminescence Dating Laboratory, University of Georgia, and the Instituto de Investigaciones Antropológicas, Universidad Nacional Autónoma de México (UNAM), Mexico City, Mexico, 2006-2011.

7. FUNDING

1. Geoarchaeology of the Oconee Reservoir Site, Greene County. Georgia Power Co. subcontracted through the Dept. of Anthropology, University of Georgia, 1978 (\$8,094).

2. The historical development of sinkholes in southwest Georgia and predictive models for the future. Georgia Dept. of Natural Resources, Geologic and Water Resources Division, 1978 (\$800).
3. Comparative analysis of terrestrial and Martian labyrinth terrains. NASA Mars Data Analysis Program, NSG 539, 1979-1982 (\$50,900).
4. Relationships between lineaments and groundwater flow in the Southwest Georgia aquifer (with R. E. Carver). Department of the Interior, Office of Water Research and Technology, 1979-1981 (\$17,160).
5. Paleoclimatic reconstruction by analysis of cave deposits. University of Georgia Research Foundation, Inc., 1980 (\$2,250).
6. Geohydrology and paleohydrology of the Okefenokee Swamp, Georgia (with R. E. Carver and M. J. Duever). Funded through N.S.F. grant, "Integrated Studies of the Okefenokee Swamp Ecosystems," Principal Investigator B. C. Patten, 1979-1982 (\$89,771).
7. Quaternary paleoclimates of the Eastern Transvaal, South Africa: The record preserved in caves. University of Georgia Research Foundation, Inc., 1981 (\$3,500).
8. Richard B. Russell multiple resource areas, geomorphology of three prehistoric sites in Elbert County, Georgia. Project included in funding from the National Parks Service to Southeastern Wildlife Services, Inc., 1981 (\$700).
9. Integrated studies of the Okefenokee Swamp ecosystem IV: long term ecological research in freshwater wetlands (with B. C. Patten, K. Porter, R. Hodson and J. Laerm). National Science Foundation LTER Program, 1982-1987 (\$1,311,468).
10. The late Quaternary paleoanthropology of Northeastern Somalia (with S. A. Brandt). University of Georgia Research Foundation, 1981-1983 (\$12,000).
11. Paleoenvironmental analysis from cores of speleothems in Carlsbad Caverns (with B. B. Ellwood). National Geographic Society, 1983-84 (\$13,500).
12. Geological factors influencing ground water flow and well productivity on the Georgia Piedmont. Office of Water Policy, 1983-84 (\$10,750).
13. Collaborative research on the Okefenokee Swamp ecosystem (with B. C. Patten, R. E. Hodson, and M. J. Duever). National Science Foundation, 1984-85 (\$246,946).
14. Estimating the surface water resources of the Georgia Coastal Plain and predicting the effects of changing land-use patterns. U.S. Geological Survey, Department of Interior, 1984-85 (\$12,000).
15. Late Pleistocene/Early Holocene subsistence and settlement patterns in Southern Somalia (with S. A. Brandt and H. T. Bunn). National Science Foundation, 1985-86 (\$89,599).
16. Quaternary paleoenvironmental data for tropical Africa from cave sediments. National Geographic Society, 1987-89 (\$19,600).
17. Long paleoenvironmental records from African cave sediments (with D. A. Burney and J. B. Cowart). National Science Foundation, 1989-91 (\$154,473).
18. Excavations of the White Paintings Shelter, Tsodilo Hills, Botswana. Subcontract of \$2,000 to undertake geomorphological studies of White Paintings Rock Shelter. National Geographic Society Grant #4097-89 to Larry H. Robbins of Michigan State University, 1989.
19. Funds to establish a Palaeoecology Laboratory in the Department of Geography, Center for Archaeological Sciences, and University of Georgia Museum of Natural History (\$8,000 from University of Georgia), 1989.
20. Paleoenvironmental data from speleothems in Karain Cave, Turkey. Invited research by Professor Isin Yalcinkaya, University of Ankara, Turkey, University of Georgia Research Foundation and College of Arts and Sciences (\$3,000), 1989.
21. Ethnoarchaeology, prehistory and paleoenvironment in the Western Kalahari (with L. H. Robbins). National Science Foundation, 1991-1993, \$123,909.
22. The consequences of continued global warming on the vegetation of the Southeastern U.S.A.: Evidence from the Last Interglacial. U.S. Department of Energy through the National Institute for Global Environmental Change, Southeast Regional Center, 1992-93, \$78,220.
23. Ethnoarchaeology, prehistory and paleoenvironment in the Western Kalahari. National Science Foundation REU Supplement 1993, \$3,750.
24. A high-resolution environmental record for Southern Africa from annual layers, pollen and microscopic charcoal in cave speleothems (with L. B. Railsback, J-C. Thill and R. S. Meltzer). NOAA 1995-1997, (\$60,000).

25. Archaeological investigation and paleoenvironmental context of mining at the Tsodilo Hills, Western Kalahari Desert (with L. H. Robbins). National Science Foundation, 1995-97, \$150,000.
26. Dissertation Research: Late Quaternary climate variation within the Maya Lowlands, Belize, Central America as evidenced by variations in speleothem deposition (with J.W. Webster). National Science Foundation, 1996-97, \$9,975.
27. Protecting high-risk wetlands in Georgia's Coastal Plain from anthropogenic groundwater perturbations, 1995-97. U.S.Geological Survey, \$21,000.
28. Quaternary environments at El-Garrah Cave, Western Desert of Egypt. University of Georgia Research Foundation, 1996-97, \$6,000.
29. Plio-Pleistocene fossil breccias in caves of the Koanaka Hills, Botswana. Collaboration invited by Blythe Williams and Diane Waddle of the Department of Biological Anthropology and Anatomy, Duke University Medical Center, and Callum Ross, Department of Anatomical Sciences, SUNY, Stonybrook. ~\$1,000 was provided by grant from Duke University for fieldwork in Botswana, June 1995.
30. Exploration of caves in the Koanaka and Aha Hills of Botswana for Plio-Pleistocene fossils. Collaborator on National Geographic Grant to Callum Ross of SUNY, Stonybrook. Fieldwork in summer 1997.
31. Establishment of a TL/OSL Dating Laboratory at the University of Georgia. University of Georgia Research Foundation, 1998, \$130,000.
32. Dissertation Research: Human-environmental relationships in Coastal Plain Georgia based on high-resolution paleoenvironmental records from three peat deposits (with H. LaMoreaux). National Science Foundation, 1998-99, \$9,665.
33. Dissertation Research: Hydrologic and geochemical response of conduit-flow and diffuse-flow karst systems to variability in seasonal climate and individual storm characteristics (with Shaw –Wen Sheen). National Science Foundation, 1999-2000, \$11,430.
34. High-resolution ENSO and other paleoenvironmental data for the last 20 ka from cave speleothems in Madagascar and Botswana (with L. B. Railsback). National Science Foundation, 1999-2005, \$371,521.
35. Ain Shams-University of Georgia Geography Partnership Program (with N.S. Embabi). Binational Fulbright Commission, 2000-2002, \$50,000.
36. High-resolution climate records for China for the last 2,000 Years from cave stalagmites and gazetteer records (with C.P. Lo). University of Georgia Research Foundation, 1999-2001, \$12,850.
37. Environmental change in Namibia during the last 300 ka from cave speleothems, tufas and fluvial sediments. National Science Foundation, 2000-2007, \$328,938.
38. Development of a study abroad course, The environment and archaeology of Egypt, in association with a Binational Fulbright Grant Between Ain Shams University, Cairo and the University of Georgia”. University of Georgia International Program Development Fund (\$2,400) and Dean, College of Arts and Sciences (\$500), 2000-2001, \$2,900.
39. Doctoral Dissertation Research: High-resolution climate and land-use records from cave stalagmites and county gazetteers for China over the last 2000 years (with Honglin Xiao). National Science Foundation, 2000-2001, \$10,000.
40. Paleobiogeographical tracks in isolated dune faunas of Southwestern Africa (with Eugene Marais and John Irish). National Geographic Society, 2002-2004, \$25,050.
41. Archaeological and paleoenvironmental investigation of the initial appearance of domesticated livestock in the Lake Ngami region of Botswana and the LSA background (with Larry Robbins). National Science Foundation, 2003-2007, Georgia portion of grant \$56,286.
42. Trace Element Fingerprinting of Hematite from Prehistoric Mines at the Tsodilo Hills, Botswana (with L. H. Robbins). Missouri University Research Reactor, Archaeological Neutron Activation Analysis Services. Awarded a reduced NSF-supported per-sample analysis rate, 2005-06.
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- Brook, G. A. (1995). Quaternary environments in the African and Indian Ocean tropical zone: Evidence from cave sediments in Somalia, Zaire, Botswana, Namibia and Madagascar. Programme with Abstracts, International Association of Geomorphologists Southeast Asia Conference, Singapore, June 1995 (invited presentation), p. 34.
- Brook, G. A. (1995). Quaternary environments in the Somali-Chalbi and Kalahari Deserts of Africa. Abstracts of the International Conference on "Quaternary Deserts and Climatic Change.", International Geological Correlation Program (IGCP-349), Al Ain, United Arab Emirates, December 1995, p. 6.
- Brook, G. A. (1995). Quaternary environments of the Transvaal, South Africa, from evidence preserved in caves. Abstracts of the Association of American Geographers Southeastern Division Annual Meeting, Knoxville, Tennessee, Nov. 18-21, p. 2.
- Brook, G. A., Feeney, T. P. (1995). Morphology and denudation of quartzite and limestone pavements in Southern Africa and North America: Are they small-scale versions of labyrinth karst? Abstracts of the International Symposium on Karren Landforms, Palma de Mallorca, Spain, Sept. 19-22, 1995 (presented by Feeney).
- Brook, G. A. (1996). Environmental change at Tsodilo Hills, Botswana, since the Last Interglacial. Abstracts of the Association of American Geographers 92nd Annual Meeting, Charlotte, North Carolina, April 10-13, 1996, p. 34.
- Brook, G.A. (1997). Cave and tufa evidence for climatic change in Eastern and Southern Africa during the last 300 kyr. Abstracts of the Association of American Geographers 93rd Annual meeting, Fort Worth, Texas, April 1-5, 1997, p. 31.
- Brook, G. A. (1997). Environmental change at Tsodilo Hills, Kalahari Desert, Botswana: Evidence from ancient lake and rock shelter sediments. Program and Abstracts, IGCP-349 International Conference on "Quaternary Deserts and Climate Change", University of Wollongong, Australia June-July 1997, p. 60.
- Brook, G.A., Sheen, S.-W. (1999). Cyclicity in precipitation and stream discharge in Georgia and relationships with the Southern Oscillation. 95th Annual Meeting of the Association of American Geographers. Honolulu, Hawaii, March 23-27, Abstract CD, p. 65-66 (presented by Sheen).
- Sheen, S.-W., Brook, G.A. (1999). Karst chemical denudation: a global model. 95th Annual Meeting of the Association of American Geographers. Honolulu, Hawaii, March 23-27, Abstract CD, p. 544 (presented by Sheen).
- Sheen, S.-W., Brook, G.A. (1999). Chemical and biological aspects of tufa deposition at Pocket Branch, Georgia. 54th Annual Meeting of the Southeastern Division of the Association of American Geographers. Tampa, Florida, November 21-23, Abstracts of Papers, p.20. (presented by Sheen).

- Xiao, H., Brook, G.A. (2000). Stalagmite climate record for the last 570 years from Guizhou, China, compared with gazetteer information. Presented by Xiao at the First International Conference on the Karst and Caves of Guizhou, August 2000.
- Brook, G.A., Srivastava, P., Singhvi, A.K. (2003). OSL dating of sediment layers in cave stalagmites: new approaches, applications and implications. Abstract Volume: The 2nd North American Luminescence Dating Workshop, Albuquerque, NM, August 13-16, 2003.
- Alexander, C.R., Ivester, A.H., Brook, G.A., Srivastava, P. (2004). Preliminary chronology of the back-barrier islands of the Georgia coast: Implications for saltmarsh formation. Presented by Alexander at the Chapman Conference on Saltmarsh Geomorphology, Halifax, Nova Scotia, Canada, October 2004.
- Forrest, B.M., Donoghue, J.F., Stapor, F.W., Brook, G.A., Brook, F.Z. (2005). Late Quaternary evolution of the Appalachian, Florida, barrier island rim and its relationship to sea-level change. Presented by Beth Forrest at the 54th Annual Meeting of the Southeastern Section of the Geological Society of America, Biloxi, Mississippi, March 2005.
- Marais, E., Brook, G.A., Srivastava, P. (2005). Rivers in the desert: The Sossusvlei playa and the Namib. Presented by Marais at the Southern African Society for Quaternary Research (SASQUA) 2005 XVI Conference, Bloemfontein, South Africa, March-April 2005.
- Brook, G.A. (2006) Late Pleistocene-Holocene history of Lake Ngami, Botswana based on OSL dating of fluvial and lacustrine sediments. Association of American Geographers, Annual Meeting, Chicago, IL March, 2006.
- Liang, F., Brook, G.A. (2006). Variations in Asian Monsoon strength during the Holocene: stalagmite evidence from Guizhou Province, China. Association of American Geographers, Annual Meeting, Chicago, IL March, 2006.
- Kiehn, A., Brook, G.A., Dake, J. Z., Glascock, M.D. (2006). Fingerprinting specular hematite from mines in Southern Africa. American Chemical Society Meeting and Exposition, Atlanta GA, March 26-30 2006.
- Brook, G.A. (2006). OSL dating of fluvial and lacustrine sediments in Quaternary studies: the late Pleistocene-Holocene history of Lake Ngami, Botswana, Southern Africa. Abstract Volume, PAGES International Symposium "Reconstructing Past Regional Climate Variations in South America over the late Holocene", Malargüe, Mendoza, Argentina, October 4-7, 2006, p. 61.
- Brook, G.A. (2006). Stalagmite evidence of droughts in Belize at the time of the Classic Maya collapse and the potential for similar high-resolution paleoenvironmental records from speleothems in Southern South America. Abstract Volume, PAGES International Symposium "Reconstructing Past Regional Climate Variations in South America over the late Holocene", Malargüe, Mendoza, Argentina, October 4-7, 2006, p. 32.
- Brook, G.A. (2006). Luminescence dating of relict lake shorelines and relict dunes: a late Quaternary wet or dry history of the Etosha Pan region of Namibia. Abstract Volume, PAGES International Symposium "Reconstructing Past Regional Climate Variations in South America over the late Holocene", Malargüe, Mendoza, Argentina, October 4-7, 2006, p. 60.
- Pavich, M.J., Markewich, H.W., Brook, G.A. (2006). Significance of Kent Island Formation to geomorphic history of the Mid-Atlantic region. Geological Society of America, Annual Meeting, Philadelphia, PA, 22-25 October, 2006 (presented by Pavich).
- Liang, F., Brook, G.A. (2006). Mid- to late-Holocene Asian summer monsoon variability: stalagmite evidence from Southwestern China. Southeastern Division of the Association of American Geographers, Annual Meeting, Morgantown, VA, November, 2006.
- Donoghue, J.E., Forrest, B.M., Balsillie, J.H., Stapor, F.W. Jr., Kish, S.A., Brook, G.A., Brook, F.Z. (2007). Late Quaternary sea-level history for the northern Gulf of Mexico and its impact on barrier growth and development. 56th Annual Meeting, Southeastern Section, Geological Society of America, Savannah, Georgia, 29-30 March, 2007 (presented by Forrest).
- Brook, G.A. (2007). Late Pleistocene and Holocene Environmental Change Revealed by Historical Records and OSL-dated Fluvial and Lacustrine Sediments in Etosha Pan, Namibia and Lake Ngami, Botswana. IGU Arid Lands, Humankind, and Environment Commission Meeting "Dryland and Impediments to Development", Riyadh, Saudi Arabia, February 20-22, 2007.
- Brook, G.A. (2007). Stalagmite evidence of droughts in Belize at the time of the Classic Maya collapse. Session "Quaternary Environments of the Americas IV: Innovative Approaches. Association of American Geographers, Annual Meeting, San Francisco, CA, April 2007 (presented by Liang).

- Liang, F., Brook G.A. (2007). A Holocene record of environmental change in the Southeastern USA from DeSoto Caverns, Alabama. Association of American Geographers, Annual Meeting, San Francisco, CA, April 2007 (presented by Liang).
- Donoghue, J. F., Stapor, F.W., Kish, S. A., Forrest, B.M., Brook, G.A., Brook, F.Z., and Balsillie, J. H. (2008). Northern Gulf of Mexico Holocene sea-level history and its impact on barrier growth. AGU-ASLO Conference, March 2-7, 2008, Orlando, Florida (presented by Donoghue).
- Brook, G. A., Scott, L., Railsback, L. B. (2008). A 35,000-year pollen and isotope record of environmental change from a speleothem in Wonderwerk Cave, South Africa. The Fifth International Conference, Climate Change: The Karst Records, Chongqing, China, June 2-5.
- Scott, L., Gil-Romera, G., Marais, E., Brook, G. A., and Chase. B. (2008). Terrestrial pollen evidence for some phases of vegetation change in the Namib Desert since ca. 47 ka, Third Southern Deserts Conference, Molopo Lodge, South Africa, September 16-19 (presented by Scott).
- Liang, F. and Brook, G.A. (2008). A mid- to late-Holocene high-resolution record of environmental change in the Southeastern USA from DeSoto Caverns, Alabama. AAG Annual Conference, Boston, MA, April 15-19 (4/18) (presented by Liang).
- Kotlia, B.S. and Brook, G.A. (2009). Multi-annual scale Holocene climatic changes using speleothems to supplement lake records: a beginning in the Indian Himalaya. Third LIMPACS (Human Impacts on Lake Ecosystems: IGBP, PAGES) Conference "Holocene Lake Records", Chandigarh, India, March 5-8, 2009 (presented by Kotlia and Brook).
- Brook, G.A. (2009). Timing of Holocene lake level changes in Etosha Pan, Namibia, and Lake Ngami, Botswana. Third LIMPACS (Human Impacts on Lake Ecosystems: IGBP, PAGES) Conference "Holocene Lake Records", Chandigarh, India, March 5-8, 2009.
- Liang, F. and Brook, G.A. (2009). Stalagmite evidence from Panigarh Cave of a wetter Little Ice Age in the Himalayan foothills of India. AAG Annual Conference, Las Vegas, NV, March 22-27 (3/22) (presented by Liang).
- Brook, G.A., Moyes, H., Awe, J., and Webster, J. (2009). Stalagmite evidence from Belize indicating significant droughts during the Classic Maya era, Symposium: The Great Maya Droughts in Cultural Context, Society for American Archaeology 74th Annual Meeting, Atlanta, April 22-26, 2009.
- Moyes, H., Webster, J., Awe, J., and Brook, G.A. (2009). Ritual and the environment: evidence for a Late Classic drought cult in western Belize, Symposium: The Great Maya Droughts in Cultural Context, Society for American Archaeology 74th Annual Meeting, Atlanta, April 22-26, 2009 (presented by Moyes).
- Iannone, G., Moyes, H., Awe, J., Brook, G.A., Webster, J., Conolly, J. (2009). Socio-environmental dynamics in the North Vaca Plateau, Belize: a long term perspective, Belize Archaeology Symposium, Institute of Archaeology, Belize, C.A., July 1-3 2009 (presented by Iannone).
- Suther, B.E., Leigh, D.S. and Brook, G.A. (2010). Ages of Fluvial Terraces in the Little River Valley, Upper Coastal Plain, North Carolina. The Geological Society of America, Northeast Section (45th Annual) and Southeast Section (59th Annual) Joint Meeting, Baltimore MD, March 13-16, 2010 (presented by Suther).
- Litwin, R.J., Smoot, J.P., Pavich, M.J., Markewich, H.W., Brook, G.A. and Verardo, S. (2010). Hybla Cores 7 & 8: An 80,000-Year Late Pleistocene Climate Record from The Mid-Atlantic Coastal Plain of North America. The Geological Society of America, Northeast Section (45th Annual) and Southeast Section (59th Annual) Joint Meeting, Baltimore MD, March 13-16, 2010 (presented by Litwin).
- Pavich, M.J., Markewich, H.W., Litwin, R.J., Smoot, J., and Brook, G.A. (2010). Significance of Marine Oxygen Isotope Stage OIS5a and OIS3 Dates from Estuarine Sediments Flanking Chesapeake Bay. The Geological Society of America, Northeast Section (45th Annual) and Southeast Section (59th Annual) Joint Meeting, Baltimore MD, March 13-16, 2010 (presented by Pavich).
- Ploetz, C.J. and Brook, G.A. (2010). Paleoenvironmental history of Otjimaruru Pan, Namibia, derived from OSL dating of lunette and linear dune sands. AAG Annual Conference, Washington, D.C., April 14-18 (4/17) (presented by Ploetz).
- Liang, F. and Brook, G.A. (2010). Paleoclimate variations in the Southeastern USA during the Late Holocene: Stalagmite evidence from DeSoto Caverns, Alabama. AAG Annual Conference, Washington, D.C., April 14-18 (4/18) (presented by Liang).
- Alexander, C., Rink, W., Jackson, C.W. Jr., Brook, G.A., and Ivester, A. (2011). Late Holocene geologic development of the Georgia coast. 60th Annual Meeting, Southeastern Section GSA, Wilmington NC, March 23-25 (presented by Alexander). GSA Abstracts with Programs 43(2), abstract 186024.

- Sletten, H.R., Railsback, L.B., and Brook, G.A. (2011). A 4600-year high-resolution stalagmite paleoclimate record for northeastern Namibia. 60th Annual Meeting, Southeastern Section GSA, Wilmington NC, March 23-25 (presented by Sletten). GSA Abstracts with Programs 43(2), abstract 185975.
- Mancini, M.V., Bamonte, F.P., Franco, N.V., and Brook, G.A. (2011). Paleoenvironmental conditions and changing early occupations of the south of the Deseado Massif (Patagonia, Argentina). XVIII INQUA Congress, Bern Switzerland (presented by Mancini).
- Scott, L., Neumann, F.H., Brook, G.A., Bousman, C.B., and Norström, E. (2011). Terrestrial evidence of vegetation and climate change during the last 30 ka in Southern Africa: the fossil pollen data. XVIII INQUA Congress, Bern Switzerland (presented by Scott).

Book Reviews

- Lounsbury, J. F. and Aldrich, F. T. - Introduction to Geographic Field Methods and Techniques, Charles E. Merrill, Columbus, (1979). Reviewed for Charles E. Merrill Publishing Company prior to publication, March, 1978.
- Goudie, A. S., Environmental Change, Clarendon Press, Oxford (1977). *Journal of Geography*, 78 (4), 1979, 161-162.
- LaFleur, R. G. (ed.), Groundwater as a Geomorphic Agent, Allen & Unwin, 1984 *Professional Geographer*, 37(2), 1985, p. 237.
- Jennings, J. N., Karst Geomorphology, Blackwell, 1985. *Professional Geographer*, 39(1), 1987, 109-110.
- Fernald, E.A. and Patton, D. J. (eds), Water Resources Atlas of Florida, Florida State University, 1984. *Professional Geographer*, 39(3), 1987, 369-370.
- Thomas, D. S. G. and Shaw, P. A., The Kalahari Environment, Cambridge University Press, 1991. *Geographical Review* (published, no details).
- Dardis, G. F. and Moon B. P. (eds.), Geomorphological Studies in Southern Africa, A. A. Balkema, Rotterdam, 1988. *Geomorphology*, 16, 1996, 349-350.
- Sealey, N. E., Bahamian Landscapes: An Introduction to the Geography of the Bahamas, Media Publishing, Nassau, 1994. *Southeastern Geographer*, 36(1), 1996, 87-89.

9. OTHER PROFESSIONAL ACTIVITIES

Reviewer

Journals: Professional Geographer; Journal of Sedimentary Petrology; Earth and Planetary Science Letters; South African Geographical Journal; Southeastern Geographer; Geoarchaeology: An International Journal; Geomorphology; Geomorphology: Relief, Processes, Environment; International Journal of Pure and Applied Geomorphology; Quaternary Research; Physical Geography; The Holocene; Journal of Human Evolution; Palaeogeography, Palaeoclimatology, Palaeoecology; Florida Scientist; Quaternary Science Reviews; Quaternary International; Geophysical Research Letters, Boreas, Journal of Quaternary Science.

Funding Agencies: Reviewer for: NSF Division of International Programs; NSF Geography and Regional Science Program; NSF Surficial Processes Program; NSF Anthropology Program; NSF Atmospheric Sciences Program, Georgia Cooperative Federal-State Water Resources Research Program, U.S. Dept. of Interior; NASA Planetary Geology Program; National Geographic Society; NOAA Climate and Global Change Program; Deutsche Forschungsgemeinschaft, Bonn, Germany; Inter-American Institute for Global Change Research.

Memberships

Member of IGU Working Group "Anthropogenic Impact and Environmental Changes in Karst."

Chairman of Working Group "Paleoenvironments of Presently Arid Karst Areas" within IGU Study Group "Anthropogenic Impact and Environmental Changes in Karst."

Member of the International Geological Correlation Programme, Project 252 - Past and Future Evolution of Deserts.

Chairman of Working Group "Desert Paleoenvironments from Cave Sediments." within IGCP-252 - Past and Future Evolution of Deserts.

Leader of Group studying "Pollen in Cave Speleothems" within the Working Group "Speleothem Records of Environmental Changes in the Past" of the Commission de la Physico-chimie et Hydrogéologie du Karst, Union Internationale de Spéléologie.

Member of the Southern African Association of Geomorphologists.

Organizer, Chair, or Discussant

Organizer and Chairman of a Special Session on "Karst Geomorphology," Association of American Geographers Annual Conference, Philadelphia, April 1979.

Chair of Special Session on "Land Use and Environmental Problems in Karst Terrains II," Association of American Geographers Annual Conference, Louisville, Kentucky, April 1980.

Discussant for Special Session "Student Papers on Karst," AAG Annual Conference, Louisville, Kentucky, April 1980.

Co-organizer with Mike Morrissey of a symposium "Introduction to the Processes and Landforms of Tropical Karst Regions," National Council for Geographic Education Annual Meeting, Ocho Rios, Jamaica: October 1983.

Chair of Session: Geomorphology: Geomorphologic Models at AAG Annual Meeting, Baltimore, March 19-22.

Chair of Session at the IGU Working Group Meeting on "Anthropogenic Impact and Environmental Changes in Karst," Blansko, Czechoslovakia, September, 1990.

Chair of Session: Late Pleistocene Geomorphology, Association of American Geographers Annual Meeting, San Francisco, California, March 29-April 2, 1994.

Chair of Session: "Paleoclimatic Reconstruction." Association of American Geographers Annual Meeting, Chicago, Illinois, March 15-18, 1995.

Chair of Session: "Coastal and Stream Sediment/Flow Processes." Association of American Geographers Southeast Division Annual Meeting, Knoxville, Tennessee, Nov. 18-21, 1995.

Chair of Session: "Geoarchaeology and Paleoenvironmental Records." Association of American Geographers Annual Meeting, Charlotte, North Carolina, April 9-13, 1996.

Chair of Session: "Quaternary Climate Change." Association of American Geographers Annual Meeting, Fort Worth, Texas, April 1-5, 1997.

Co-coordinator of Session 1 at the Third LIMPACS (IGBP, PAGES) Conference in Chandigarh, India, March 5-8, 2009.

Invited Lectures

- "Palaeoenvironmental Data from Sediments in Caves: Africa and the U.S.A." Department of Geography, University of Zambia, Lusaka, June 19, 1987.
- "Karst Landforms," Department of Geology, University of Zimbabwe, Mt. Pleasant, July 7 & 8. "African and North American Caves as Sources of Quaternary Palaeoenvironmental Data," Geological Society of Zimbabwe, Harare, July 20, 1987.
- "Significance of the Surface and Underground Landforms of South Nahanni, Canada," Caving Group of East Africa, Nairobi, Kenya, December 22, 1987.
- "Caves as Sources of Palaeoenvironmental Information," Caving Group of East Africa, Nairobi, Kenya, December 22, 1987.
- "Cave Sediments as Sources of Palaeoenvironmental Data for Africa and North America," Desert Laboratory Seminar Series, Department of Geosciences, University of Arizona, Tucson, January 23, 1989.
- "Cave and Rock Shelter Sediments in African Archaeology," The Athens Society of the Archaeological Institute of America, Athens, November 14, 1989.
- "Caves: A Key to Past Environments." State Museum of Namibia, Windhoek, Namibia, September 3, 1990.
- "Cave and Rock Shelter Evidence of Past Climates in East and Southern Africa." Department of Geology, University of Minnesota, Feb. 15, 1996.
- "Potential of Cave Speleothems to Provide High-resolution Palaeoenvironmental Records". Department of Geology, University of Minnesota, Minneapolis, Minnesota, Feb. 16, 1996.
- "Cave and Rock Shelter Evidence of Quaternary Environmental Change in East and Southern Africa and the Applicability of the Approach to Water Research in Oman". Ministry of Water Resources, Muscat, Oman, Dec. 16, 1995.
- "Paleoclimatic Significance of Karst Features in Deserts," Department of Geography, Ain Shams University, Cairo, Egypt, March 3, 1998.
- "The State of Geography in the United States," Department of Geography, Ain Shams University, Cairo, Egypt, March 15, 1998.
- "Medium and High Resolution Paleoclimatic Data from Cave Speleothems: A New Approach to Explaining Major Historical and Archaeological Events," Department of Geography, Texas A&M University, College Station, Texas, November 20, 2000.
- "Environmental Change and Human Activities: Evidence from Cave Stalagmites". Department of Geology Journal Club, University of Georgia, March 29, 2001.
- "Cave Speleothem Evidence of Environmental Change: Some Recent Results from Africa, the Americas and Madagascar". Department of Geography and Geology, Georgia Southern University, Statesboro, April 5, 2001.
- "Climate in Southern Africa Since AD 500: Evidence from Botswana Stalagmites". Brook, G.A., Railsback L.B. (2001). Invited paper to be presented in the "Symposium on Karst" at the Fifth International Conference on Geomorphology, Tokyo, Japan, Aug. 2001 (could not attend because of accident).
- "Some Recent Research in Southern Africa and Central America". Department of Geography, Ain Shams University, Cairo, Egypt, April 17, 2007.
- "Reminiscences of good times: adventures in two countries and some things to forget". Department of Geography, Ain Shams University, Cairo, Egypt, April 17, 2007.
- "Late Pleistocene and Holocene environmental change revealed by OSL-dated fluvial and lacustrine sediments in Etosha Pan, Namibia, and Lake Ngami, Botswana". IGU Commission 0402 Arid Lands, Humankind and Environment. King Saud University, Riyadh, Saudi Arabia, April 24, 2007.
- "Research, Preservation, and Tourism in Caves: All are Possible". Programa Provincial de Espeleología (two hour presentation to politicians, tourism operators, and speleologists about cave science, tourism, and exploration). Government workshop on cave preservation and research. Malargüe, Argentina, July 7-10, 2010.

10. TEACHING EXPERIENCE

- Junior Lecturer:** University of the Witwatersrand, Johannesburg, South Africa, 1968-1970.
Teaching Assistant, McMaster University, Hamilton, Ontario, Canada, 1971-1975.
Assistant Professor, University of Georgia, Athens, Georgia 30602, U.S.A., 1975-1981.
Associate Professor, University of Georgia, Athens, Georgia 30602, U.S.A., 1981-1987.

Professor, University of Georgia, Athens, Georgia 30602, U.S.A., 1987-present.
Merle C. Prunty Jr. Professor of Geography, UGA, Jan. 2001-present.

Courses Taught (U=undergrad only), U/G=undergrad and grad, G=grad only):

1) Earth Science Survey (U), 2) Introduction to Landforms (U), 3) Regional Geography of North America (U),
 4) Introduction to Hydrology (U), 5) Advanced Terrain Analysis (U/G), 6) Advanced Geomorphology (U/G),
 7) Global Environmental Change During the Quaternary (U/G), 8) Field Methods in Physical Geography
 (U/G), 9) Geomorphology and Environmental Change in Karst and Arid Environments (U/G), 10) Seminar in
 Geomorphology (G), 11) Seminar in Quaternary Paleoenvironments (G), General Geomorphology (U).

11. M.A., PH.D. AND POST-DOCTORAL ADVISEMENT

Doctoral

Chin-hong Sun, (1986)	-	National Taiwan University, Taiwan.
Jerry Davis, (1987)	-	San Francisco State University
Keun Bai Yu, (1986)	-	Seoul National University, S. Korea
Rudi Kiefer, (1986)	-	University of North Carolina at Wilmington
Robert Hyatt, (1984)	-	Radford University
Zhi-Yong Yin, (1990)	-	Georgia State University
Joseph Garcia, (1992)	-	University of South Florida
Steve Harper, (1996) (Geology)	-	East Carolina University
Thomas Feeney (1997)	-	Shippensburg University
Heidi Lamoreaux (1999)	-	Sonoma State University
Sydney Bacchus (Ecology) (1999)		
James Webster (2000)	-	U.S. EPA, Atlanta, Georgia
Shaw-Wen Sheen (2001)	-	National Tainan Teacher's College, Taiwan
Honglin Xiao (2003)		Elon University, Elon, NC
Fuyuan Liang (2008)	-	Northwest Illinois University

Presently advising Lixin Wang and Pete Akers

Masters

Terry Allison, (1980)	Jian Chen, (1992)
Chin-hong Sun, (1981)	Carl Seielstad (1994)
Jerry Davis, (1982)	Andrew Ivester (1995)
Neil Heywood, (1984)	Shaw-wen Sheen (1996)
Mark Hanson, (1984)	Ethan Goddard, (Geology) (1997)
James Dyer, (1986)	Dawn Reid (1998)
Ed. Luft, (1986)	Adam Kiehn (Geology) (2007)
Chris Ploetz (2011)	Pete Akers (2011)

Advisory, Reading or Examining Committees

Amy K. Van Nostrand (M.S. Geology, 1981)	Margaret Rafter (M.A. Geology, 1997)
Ken Eubanks (M.S. Geology, 1985)	James Baldini (M.A., Geology, 1999)
Joseph Garcia, (M.S. Geology, 1986)	Christopher Sturm (M.A., Geography, 1999)
Robert Shipman (M.A. Geography, 1989)	Joseph Charles (M.A. Geography, 1999)
Ronnie Rogers (M.A. Geography, 1990)	Al Bruns (M.A. Forestry, 2000)
Joseph Nicholas (Ph.D. Geography, 1991)	Wendy Weaver (M.S. Geology, 2000)
Katherine Schipke (M.A. Geography, 1992)	Kai Wang (Ph.D. Geography)
Jiaqing Gao (Ph.D. Geography, 1992)	Neeraj Vedwan (Ph.D. Anthropology, 2002)
Mike Harrison (M.A. Geography, 1992)	Matthew Doede (M.A. Geography)
Steve Williams (M.A. Geography, 1994)	Keith Goggins (M.S. Geology)
Raad Delaimi (Ph.D. Geology, 1996)	Tim Anderson (M.A. Geography)
Jill Oppenheim (M.A. Geography, 1996)	Mark Gimigliano (M.A. Geography, 1997)
Brad Suther (M.S. Geology, 2006)	Jason Ridgeway (M.S. Geography, 2006)

Michelle Luebke (M.S. Geography, 2006) Heather Bartley (M.S. Geography, 2006)
Katie Price (Ph.D. Geography, 2009) Lixin Wang (M.S. Geography 2010)

Presently on committees of Jason Meadows and Jiaying Wu (MS Geography) and Genevieve Holdridge (Ph.D. Geography)

4. **Post-Doctoral Supervision**

Chin-Hong Sun, January-July 1986.
Keun-Bae Yu, May-December 1986.
Pradeep Srivastava, December 2002-August 2005

12. SERVICE ACTIVITIES

1. **Departmental**

1975-76 Departmental Secretary in charge of minutes.
1976-77 Chairman, Computer Liaison Committee; Member, Staffing and Equipment Committees.
1977-78 Member, Computer Liaison, Curriculum and Space Utilization Committees.
1978-79 Member, Curriculum, Graduate Studies, and Equipment and Space Utilization Committees.
 Member, Budget and Resources Committee for Departmental Self-Study Report.
1979-80 Member, Undergraduate Studies and Equipment Committees.
1980-81 Member, Graduate Studies and Staffing Committees.
1981-82 Chairman, Staffing Committee.
1982-83 Chairman, Search and Screening Committee and Equipment Coordinator.
1983-84 Acting Chair and Member, Search and Screening Committee; Member, Curriculum
 Committee.
1985-86 Member, Curriculum Committee.
1987-88 Member, Graduate Studies Committee.
1988-89 Chairman, Search and Screening Committee.
 Member, Graduate Studies Committee.
1989-90 Member, Graduate Studies Committee.
1990-91 Member, Graduate Studies Committee.
1991-92 Graduate Coordinator; Member, Graduate Student Relations and Search and Screening
 Committees.
1992-93 Assistant Head of Geography May-August, 1993; Graduate Coordinator; Member, Graduate
 Student Relations and "Climatology" Search and Screening Committees.
1993-94 Acting Head of Geography
1994-99 Head of Geography
1999-00 Member, Graduate Studies Committee; Member Search and Screening Committee for
 Franklin Fellow Position.
2000-01 Member, Curriculum Committee, Member, Program Review Oversight Committee.
2004-05 Chair Ad Hoc Committee to establish P&T Guidelines, Chair of Advisory Committee
 (elected).
2005-06 Chair of Curriculum Committee, Member of Advisory Committee (elected).
2011-12 Member of Advisory Committee (elected), member Curriculum Committee.

2. **College and University**

1979-82 Geography Department College of Arts and Sciences Faculty Senate representative.
1979-82 Member, College of Arts and Sciences Faculty Relations Committee.
1980-81 Member, ad hoc grievance committee appointed by the Dean of the College of Arts and
 Sciences.
1982-85 Member, Physical Sciences Area Committee on Appointments and Reappointments to
 Graduate Faculty.
1983-84 Member, Graduate School Committee Reviewing Graduate Programs in Social Science
 Education.
1991-92 Member, Social and Behavioral Sciences Promotion and Tenure Committee of the College of
 Arts and Sciences; Member, Graduate Appointments Committee, Social Science Division,
 College of Arts and Sciences; Lunchtime Seminar Coordinator, Center for Archaeological
 Sciences.

- 1992-93 Chairman, Social and Behavioral Sciences Promotion and Tenure Committee of the College of Arts and Sciences; Member, University Council; Member, Graduate School Committee to Study Research Grading Policy; Lunchtime Seminar Coordinator, Center for Archaeological Sciences.
- 1993-95 Member, University Council.
- 1994-95 Member, Department of Anthropology Program Review Committee.
- 1994-2005 Appointed Director, Center for Archaeological Sciences in Feb. 1994, reappointed by vote of Center Associates in 1999.
- 1995-97 Chair Elect, Regents Academic Advisory Committee on Geological Sciences and Geography.
- 1997-98 Chair, Regents Academic Advisory Committee on Geological Sciences and Geography.
- 1998-99 Member, University Council
- 1999-00 Member, University Environmental Programs Enhancement Committee; Member, Program Review Committee, Center for Latin American and Caribbean Studies.
- 2002-05 Member, Franklin College Social and Behavioral Sciences Promotion and Tenure Committee.
- 2003-04 Co-Chair, Franklin College Anthropology Program Review Committee. Member, Research Foundation Committee reviewing Director, Center for Applied Isotope Studies.
- 2007 Member of Franklin College Ad Hoc Geology Program Review Committee.
- 2010-11 Member of Franklin College Committee to select Franklin College nominees for Regents, University, and Distinguished Research Professorships.

3. **International**

- 2006 Reviewed promotion dossier for the College of Humanities and Social Sciences, United Arab Emirates University, December, 2006.