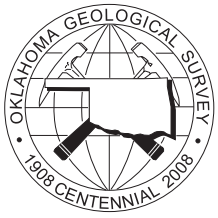
Oklahoma Geological Survey

1908 – 2008

Annual Summary 2007-2008

MEWBOURNE COLLEGE OF EARTH & ENERGY
The University of Oklahoma



Oklahoma Geological Survey
G. Randy Keller, Interim Director

Oklahoma Geological Survey
Annual Summary

2007–2008

Updated for the OGS Centennial Celebration
November 21, 2008

Compiled by
Connie Smith

Mewbourne College of Earth and Energy

The University of Oklahoma

This publication, printed by the Oklahoma Geological Survey, Norman, Oklahoma, is issued by the Oklahoma Geological Survey as authorized by Title 70, Oklahoma Statutes 1981, Section 3310, and Title 74, Oklahoma Statutes 1981, Sections 231—238. 250 copies have been prepared for distribution at a cost of $459 to the taxpayers of the State of Oklahoma. Copies have been deposited with the Publications Clearinghouse of the Oklahoma Department of Libraries.

Oklahoma Geological Survey

Annual Summary

2007–2008

(Updated November 2008)

The Oklahoma Geological Survey celebrated the Centennial of Oklahoma's Statehood and the 100th anniversary of the Survey's inclusion in the Oklahoma Constitution in 2007. Thus, even at Oklahoma's inception, it was evident that natural resources would play an important role in the future of the new state. In 2008, the Survey celebrates its actual 100 years of existence as a working agency.

The Oklahoma Geological Survey is the only such agency mandated in the constitution of a new state. Its mission was, and is, to:

Investigate the state's land, water, mineral, and energy resources and disseminate the results of those investigations to promote the wise use of Oklahoma's natural resources consistent with sound environmental practices.

Dr. G. Randy Keller

The year 2007 was a landmark for the OGS as Dr. Charles J. Mankin, director since 1967, retired on Oct. 31. During his 40 years at the helm, Dr. Mankin oversaw the growth and expansion of OGS programs, acquired the Oklahoma Geophysical Observatory at Leonard and the Oklahoma Petroleum Information Center in north Norman, and always kept in mind the mission of public service.

The interim director of the Survey is Dr. G. Randy Keller, who holds the Edward Lamb McCollough Chair in Geology and Geophysics. Dr. Keller has taken an active interest in advancing the OGS and ensuring that its core activities continue and expand to reflect current needs and issues.

Fossil Fuels

OGS oil and gas programs focus on basic studies, public service and outreach, and cooperative efforts with industry and academia. As always, there is great interest in providing key geologic expertise, tracking drilling activity, compiling well data, and providing help to individual property owners.

Survey geologists responded to requests for assistance through e-mail, telephone conversations and sometimes, personal visits. While there were requests for information from business, government or academic sources, many questions came from individuals with mineral rights.

Petroleum and Natural Gas

Woodford Shale: An ongoing and important Woodford Shale study by geologist Richard D. Andrews involves field work, examining Woodford-Sycamore and Woodford-Hunton contacts and relating them to subsurface well logs. Frequently, surface formation boundaries are different than those interpreted in the subsurface using well logs. This work helps validate formation contacts bounding the Woodford Shale.

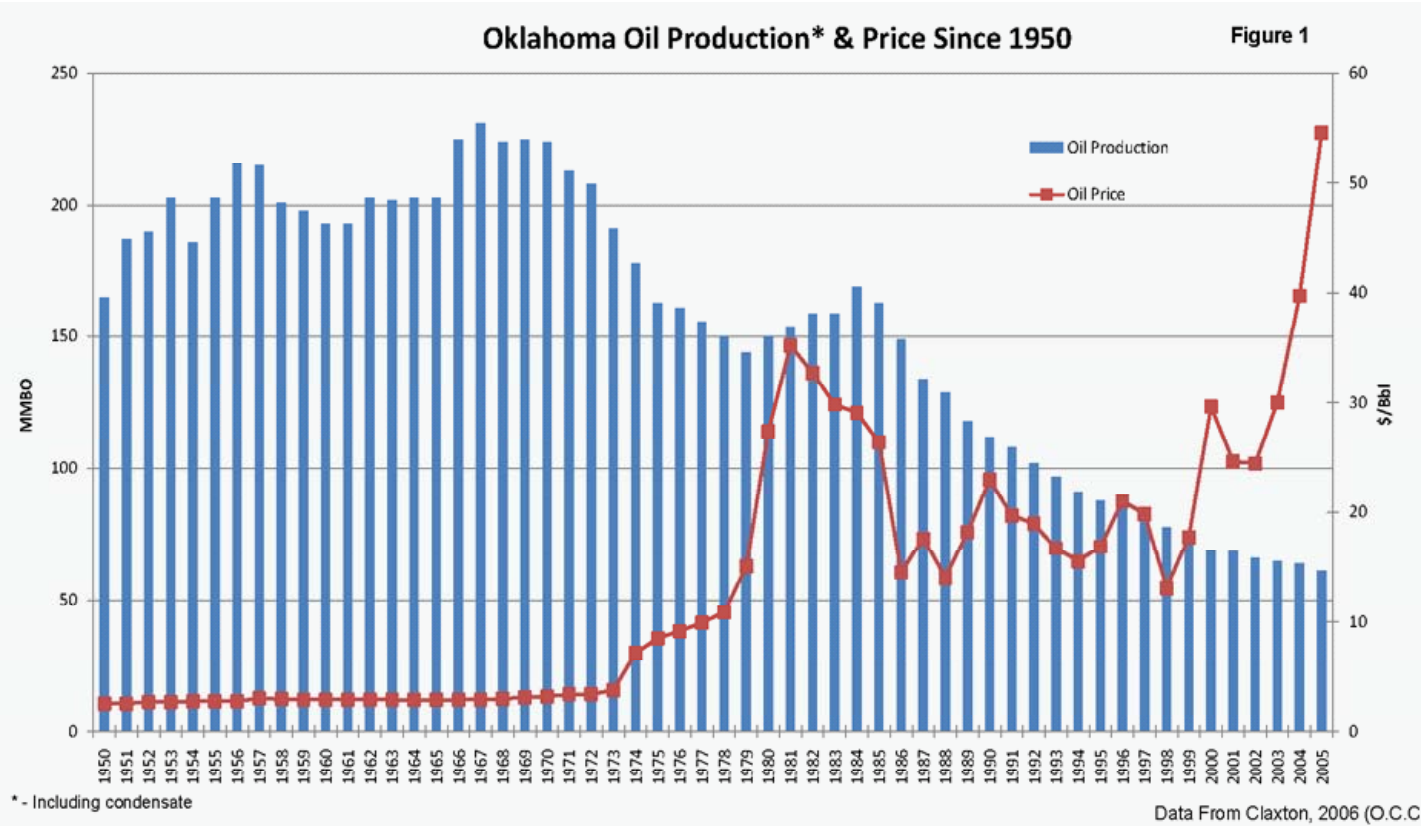
Detailed gamma-ray and outcrop measurements were made across 430 ft of Woodford/Sycamore/Hunton strata, including respective formation boundaries. These measurements include all outcrops along the north and south flanks of the Wichita Mountains near I-35. Additionally, production trends and decline curves are being prepared to update information previously reported. This work was presented at the Gas Shale workshop in October.

Andrews presented a number of talks and field trips on this subject during the year. He also helped teach Geology 4233, Subsurface Methods, with OGS geologists Dan T. Boyd and Neil H. Suneson.

Oklahoma Oil Enhancement Project: The first part of Boyd's study to determine "ideal" recovery factors for reservoirs by examining class, quality and drive mechanisms is finished and was published in the Oklahoma City Geological Society *Shale Shaker* (Fig. 1), and *Oklahoma Geology Notes*, and is available on the Web. www.ogs.ou.edu/pdf/OKultoilop.pdf

Boyd concludes that a great opportunity exists in Oklahoma to improve oil recovery from existing fields. His study found that greater access to well and production data could help operators take advantage of a huge, untapped potential in Oklahoma. His work continues as reservoir classes are being divided into subclasses, with each assigned target recovery factors. The project's goal is to prompt industry interest in opportunities for more production and induce service companies to make early production data available.

2007 Oklahoma Drilling Activity: Boyd gathered data as it arrived through IHS Energy and completed the report as the third in a series. It was published in the *Shale Shaker,* then added to the OGS Web.



Coal and Gas Shales

Interest in unconventional gas in Oklahoma has increased greatly in recent years. Starting with seven wells to the Hartshorne coal in the Arkoma Basin in 1989, there are now 5,301 records to date in the Oklahoma Coalbed Methane completions database (Fig. 2). The annual peak was 653 wells in 2005. Part of the reduced number for 2007 reflects the lag in reporting completions to the Oklahoma Corporation Commission.

The histogram (Fig. 3) shows an interest in gas shales in Oklahoma that began in 2004, following the success of the Barnett Shale in the Fort Worth Basin in Texas. The application of advanced completion techniques to shales in 2004 resulted in a total of 434 Woodford wells and 58 Caney wells being drilled in 2004–2007. The peak to date occurred in 2007, with 265 Woodford gas shale completions.

Geologist Brian J. Cardott added 187 records to his Gas Shales table that is an important feature of the OGS Web site. The table had 364 records at the end of 2007, and Cardott continues to update the files using 1002A completion reports.

Cardott posted a number of presentations, papers and updated maps on the Web, and organized the Woodford Gas Shale Conference and Field Trip, held in Oklahoma City on May 23, 2008. This workshop had 416 registrants; another 100 people were turned away due to a lack of space.

Cardott and Jane L. Weber, OGS database coordinator, also added coal chemistry data from an in-house open-file database to the analytical tables, and gas field, latitude, and longitude information to the coalbed methane table. See the OGS Web. www.ogs.ou.edu/oilgas.php

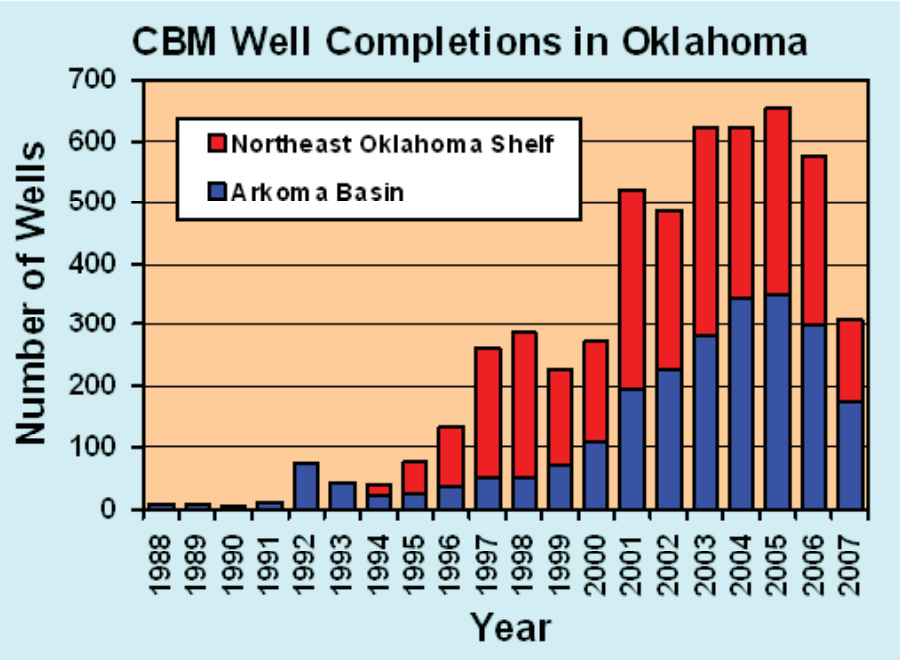


Figure 2. Coalbed methane well completions in Oklahoma, 1988–2007.

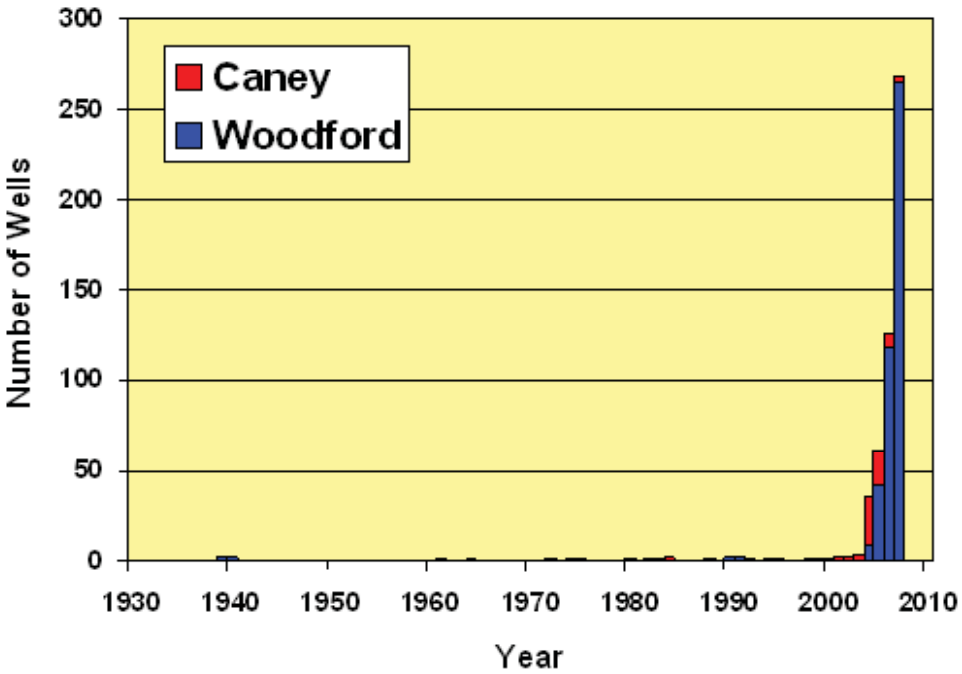


Figure 3. Number of Caney and Woodford wells in Oklahoma, 1930–2007.

Cardott continues to work with vitrinite reflectance analysis of coal samples for subsurface coal rank studies in the Arkoma Basin.

Geophysical Studies

Field Study of Micro-Earthquakes During Hydraulic Fracturing: The OGS is working with Sarkeys Energy Center to monitor hydraulic fracturing. This study involves using three-component receivers (geophones) down an adjacent borehole to locate the microearthquakes due to hydraulic fracturing in another well. The locations of the events as well as the magnitude and type of events are then used to estimate important reservoir properties (stress, pore pressure and fracture geometry).

Oklahoma Geophysical Observatory: Jim Lawson, chief geophysicist at the OGS Geophysical Observatory near Leonard in northeastern Oklahoma, reported that the OGO recorded 29 earthquakes in 2007, with four of these being felt.

The OGO also initiated installation of a new seismic network in the Oklahoma City region.

The Observatory hosted a number of visitors during the year, with seven school groups, four groups from industry, and various civic clubs and media representatives dropping by to tour and film the facility.

Some of the groups also take a side trip to the spectacular Pennsylvanian outcrops at nearby Lake Bixhoma to collect fossils.

The OGO operates its own earthquake Web page off the OGS site and receives about 30,000 hits per month.

Kenneth V. Luza, engineering geologist, continued to make numerous television appearances and take calls

In Memoriam
James E. Lawson, OGS Chief Geophysicist
Dec. 27, 1938–Aug. 4, 2008

OGS Chief Geophysicist James E. Lawson tragically was killed Aug. 3 in a car wreck just outside of Bixby, Okla. near the Oklahoma Geological Survey Geophysical Observatory at Leonard. Lawson, 69, had worked at the Observatory since 1970, before it was incorporated into the OGS in 1978.

Jim lived on the grounds of the Observatory and often worked long hours at the facility. He was available day and night to the news media when an earthquake occurred. He was very involved with the Red Cross, and donated much of his spare time to testing and analyzing blood samples.

When a group of Russian scientists came to monitor a Nevada Test Site blast in March of 1992, they were greeted by new road signs made just for their visit. One read "Observatory Lane" and the one leading to their compound was "Glasnost Road." Jim had worked hard to see that he was familiar with all the treaty terms and conditions, and also went to great lengths to make sure his guests were comfortable and properly welcomed.

Jim will be missed as a colleague and friend by the OGS staff.

The photo above was taken at the Observatory in 2007, and the photo below was from the 1990s when a base marker to study continental drift was installed at the Observatory.

to answer questions about earthquakes. Luza, Lawson, and interim director Randy Keller all helped in the effort to supply answers to the media.

Luza also worked with Lawson to produce the annual earthquake update for *Oklahoma Geology Notes*.

Geologic Mapping

STATEMAP: Thomas M. Stanley, OGS geologist, is in charge of the Oklahoma Geological Survey's STATEMAP program, which is a cooperative funding effort between the U.S. Geological Survey and state geological surveys. The primary goal of the program is to develop a geologic framework in areas determined to be of important economic, social or scientific interest to the individual states.

Mapping for 2007 in the STATEMAP program included two 7.5' quads in the Tulsa Metro Area (the Broken Bow and Leonard quads) and one 1° sheet (the Enid quad). The two TMA quads are located southeast of the city of Tulsa and represent the second year of a multiyear project within the ongoing STATEMAP program in the Tulsa area.

In this area, the focus of mapping is to aid urban planners and developers in their decision-making process on balancing land use issues among housing and road development needs, recreational needs and continued availability of unrenewable resources for mining. This primarily is done by first determining the distribution, geologic characteristics and structural tendencies of the local geology as well as that of specific limestone, sandstone, and mineable coal beds, all achieved by detailed mapping.

Besides mapping the important resource rock in an area, detailed mapping allows for increased understanding of the extent of shale formations that contain a large amount of shrink-swell clays, or clays that can adversely affect building foundations.

Reconnaissance mapping of the Enid 1° sheet is completed, and finished field sheets have been digitized and published. The emphasis of the reconnaissance mapping part of STATEMAP is to complete and make available to the public small-scale geologic maps in areas that require modern, digital maps at 1:100,000 scale. These areas currently are covered by good to poor mapping, all of which need to be compiled, field checked, corrected, then digitized onto a single standardized topographic base. These smaller-scale geologic maps will be used in ongoing compilation of the new 1:500,000-scale geologic map of Oklahoma.

In addition to the traditional mapping activities, the quadrangle maps are being added to the OGS Web site as soon as they are ready. Ten maps were added in 2007, and 70 were online by the summer of 2008. www.ogs.ou.edu/geolmapping.php

Lake Bixhoma: Stanley also initiated a study of the geology surrounding Lake Bixhoma south of Tulsa. This project will inform the general public on local geology of interest, and will include descriptions of rocks, fossils and general geologic features exposed along the lake's hiking trails. The study will result in an addition to the Survey's popular Information Series.

Industrial Minerals

Streambed sediments and soils across Oklahoma were sampled in every quadrant and the panhandle. The 420 samples weighed an estimated 3,450 lbs and were gathered from Feb. 6 through May 2, 2007, by geologist Stanley T. Krukowski, who logged 10,304 miles in that period.

The samples will be shipped in the summer of 2008 after they are properly air-dried. The project is a continuation of the OGS/USGS Geochemical Mapping project that began in 2006.

Krukowski participated in the Oklahoma Regional Economic Development Partnership Conference in 2007, where he joined the panel discussion "Value Added ED—How I Learned to Love Red Cedar" in which red cedar, biofuels, iodine, and geothermal energy resources were discussed.

The OGS also was involved with the Department of Commerce and NRCS Resource Conservation and Development Site Location Assistance program for northwest Oklahoma in December 2007.

OPIC

The Oklahoma Petroleum Information Center in north Norman contains: 408,402 boxes of well cores and/or cuttings, well logs from some 400,000 wells, and Oklahoma Corporation Commission Completion Reports (1002As) from the 1904 to the 1990s.

OPIC offers core gamma scan, X-ray imaging, core slabbing and cutting, plugging, photography services and layout tables for viewing.

Customers can have material shipped directly to them or view it at OPIC by appointment.

The OPIC conference center will hold groups of up to 60, and has ample free parking available.

Earth Science Education

The OGS offers teacher workshops, field trips, special learning and lesson-plan sessions, and in-class visits as part of the special programs available to teachers. Geologist James R. Chaplin has an extensive list of programs geared to specific

In Memoriam: Walter Esry
Core Library Manager
July 11, 1925–Nov. 3, 2008

Walt Esry died of natural causes Nov. 3, 2008, in Norman.

Walt joined the Survey in 1982 as assistant Core Library manager, then became manager after Eldon Cox retired. Walt retired from the Survey in 2004. Before coming to Norman, he had a successful picture framing business in Dallas that later became a framing and museum-exhibit design company in New York.

Longtime friend and OGS geologist Jock Campbell noted that Walt "ran the facility with savoire faire," and even incorporated two cats into the Core Library family. Walt was instrumental in getting the library collection ready for the move to OPIC in 2002.

He will be missed by many.

age groups, and a special room at OPIC is set aside for teachers to come for hands-on sessions, then leave with specific lesson plans created by Chaplin. The activities are outlined on the OGS Web. www.ogs.ou.edu/chaplinteachered.php

Geologists Suneson, Boyd and Andrews teamed up for the spring 2008 semester at OU to teach Geology 4233, Subsurface Methods in Petroleum Geology, for the ConocoPhillips School of Geology and Geophysics. Class information was available on the Survey Web site.

OGS hosted a two-day field trip March 8 and 9 for the Petroleum Engineering 3003 class, and Boyd gave guest lectures for Petroleum Engineering 4553 and 5613, discussing petroleum geology and subsurface methods.

Engineering Geology

Engineering geologist Kenneth V. Luza continues his studies in northeastern Oklahoma in the Tar Creek area of the old Picher Field in the Tri-State Mining District. Luza has studied the problems in this area since the 1980s, and his reports and personal assistance have been invaluable to various state and federal agencies working to solve problems faced by the residents.

The environmental hazards in the area include the lead content of the chat piles, shaft collapse from old mines, and water contamination.

Cartographic Section

The OGS cartography department provides map production and graphic support for the Survey's research projects, publications, open-file reports, presentations, promotional material and Web pages. Manager James H. Anderson and GIS specialist Russell Standridge work with a variety of graphic and GIS software packages to provide material in a variety of file formats and sizes.

During this fiscal year, work was completed on several guidebooks, including western Arbuckle Mountains, Beavers Bend State Park, Quartz Mountains, southwestern Ozark Uplift, and Booch Sandstones in southeastern Oklahoma.

Cartography also completed work on the major publication Circular 112A, *Stratigraphic and Structural Evolution of the Ouachita Mountains*, that was released in November 2008.

The cartographic section produces three to four geologic maps each year using data collected by the mapping team. The result is 1:24,000 and 1:100,000 U.S. Geological Survey quadrangle sheets for STATEMAP. Among the maps in production this fiscal year were the Enid 1:00,000 quad sheet and the Broken Bow and Leonard 1:24,000 sheets. The maps as PDF files and data files are available for download on the Web. www.ogs.ou.edu/geolmapping.php

The Oklahoma Petroleum Information Center (right), also known as OPIC.

OGS Web

The Survey began adding updated quadrangle maps to the Web in late 2007, and had more than 70 maps available by late summer 2008.

Russell Standridge and Connie Smith, OGS information officer and webmaster, updated the pages making the data and maps easier to access.

OGS publications are being added for free download and document archiving. Paul Smith, copy center supervisor, and Richard Murray, copy center operator, are scanning publications to PDF files on new equipment that was purchased in 2008.

By November of 2008, there were 45 Bulletins, two Circulars, 10 Guidebooks, three Information Series, 36 Mineral Reports, one Open File, and two Special Publications online. More publications are added weekly.

Updates are made regularly to the oil and gas and coalbed methane pages, and maps and other new features such as recent earthquake information appear almost daily.

Meetings and Public Service

All OGS staff are involved in public service. Questions, problems and an occasional rock are brought in by walk-in visitors, while phone calls and e-mails generate daily responses from staff to requests for information and assistance.

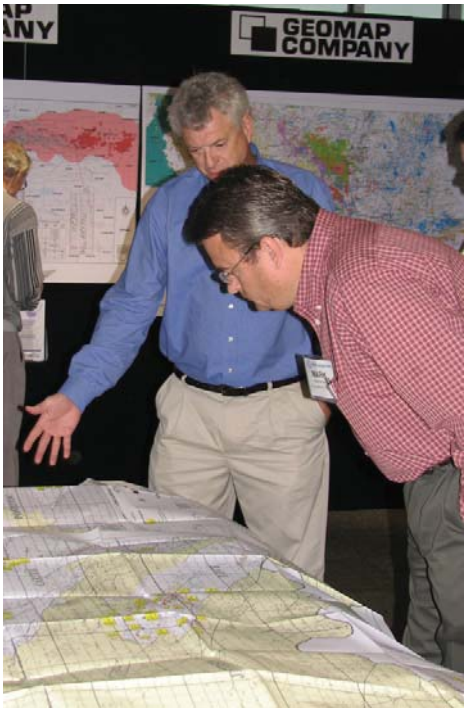
Michelle J. Summers, technical project coordinator, along with Jane L. Weber, database coordinator, Sue B. Crites, *Geology Notes* editor, and Tammie K. Creel, administrative assistant, together plan and coordinate efforts to transfer technical information to industry. Many events and meetings involve as much as one-half of the Survey staff.

From January 2007 through October 2008, the OGS sponsored the following technical events:

- Produced Water Issues and Casing Leak Prevention and Repair Workshop, co-sponsored with Petroleum Technology Transfer Council, Feb. 7, 2007, Smackover, Ark.; 28 attendees
- Woodford Gas Shale Conference, May 23, 2007, Oklahoma City; 426 attendees
- Woodford Gas Shale Field Trips, May 22 and 24, 2007, Ardmore, Okla.; 123 attendees
- Gas Reservoir Evaluation With Limited Data Workshop, Aug. 8, 2007, Norman, Okla.; 76 attendees
- Woodford Gas Shale Field Trip Chesapeake Energy, Oct. 3, 2007, Ardmore, Okla.; 35 attendees
- Woodford Gas Shale Field Trip St. Mary Land and Exploration, Oct. 10, 2007, Ardmore, Okla.; 23 attendees
- Mid Continent Granite Wash Conference, March 6, 2008, Norman, Okla.; 234 attendees
- 44th Forum on the Geology of Industrial Minerals Annual Meeting, May 11–16, 2008, Midwest City, Okla.; 94 attendees
- 44th Forum on the Geology of Industrial Minerals Nine Field Trips, May 11–16, 2008, Midwest City, Okla.; 117 attendees
- Horizontal Drilling Workshop, June 18, 2008, Norman, Okla.; 198 attendees
- Oklahoma Gas Shales Conference, Oct. 22, 2008, Midwest City, Okla.; 327 attendees
- Oklahoma Gas Shales Field Trips, Oct. 21 and 22, 2008, Ardmore, Okla.; 85 attendees
- The Real Deal Mid-Continent Prospect Expo, Oct. 29, 2008, Oklahoma City; 246 attendees

Outreach Efforts:

- Oklahoma Association for Environmental Education, Feb. 7, 2007, Norman, Okla.; 105 attendees
- Oklahoma Aggregates Association Sixth Annual Meeting & Field Trip, Feb. 20 and 21, 2007, Oklahoma City; 270 attendees
- Mayo Demonstration School for Science & Technology, Tulsa, Okla.; 49 students
- AAPG/OU Student Expo, March 15–17, 2007 Norman, Okla.; 300 attendees
- ScienceFest Okla., April 19, 2007, Oklahoma City; approximately 700 attendees
- 2007 Oklahoma Oil and Gas Trade Expo (Commission on Marginally Producing Oil and Gas Wells), Oct. 18, 2007, Oklahoma City; 2,000 attendees
- 2007 Oklahoma Mineral and Gem Society, Nov. 3 and 4, 2007, Oklahoma City; 1,200 attendees
- Oklahoma Association for Environmental Education, February 7, 2008, Broken Arrow, Okla.; 200 attendees
- Oklahoma Aggregates Association Seventh Annual Meeting and Field Trip, Feb. 12 and 13, 2008, Oklahoma City; 290 attendees
- Oklahoma Aggregates Association "Aggregates Day at the Capitol," Feb. 27, 2008; 400 attendees
- GIS Day at the Capitol, March 12, 2008, Oklahoma City; 250 attendees



- ScienceFest Oklahoma, April 17, 2008, Oklahoma City; 400 attendees
- American Association of Petroleum Geologists Annual Meeting, April 20–23, 2008, San Antonio, Texas; 7,530 attendees
- Earth Day at the Oklahoma Capitol—Oklahoma Section AIPG, April 22, 2008, Oklahoma City; 500 attendees
- Water Appreciation Day at the Capitol, May 14, 2008, Oklahoma City; 150 attendees
- Geological Society of America, Oct. 5–9, 2008, Houston; 9,922 attendees
- 2008 Oklahoma Oil and Gas Trade Expo, Oct. 16, 2008, Oklahoma City; 2,500 attendees

Total Number Play Based Workshops:	85
Total Number Field Trips:	38
Total Number Conference & Workshops:	45
Total Number Workshops OGS/MWC/AOGC:	192
Total Number Conference/Workshops/Field Trips:	360

OGS Conference/Workshops 2008 Attendees:	1,333
OGS Field Trips 2008:	11 (Attendees 202)

Outreach Programs:	6 (2007 attendees 4,099)
Outreach Programs:	10 (2008 attendees 22,142)

Total Number Attendees 1995 through October 2008: 16,756
(OGS Conferences, Workshops and Field Trips)

Participants at the OGS Gas Shales conference (above) at the Reed Center in MIdwest City, Okla., and field trip (right) held in October of 2008

2007–2008 OGS PUBLICATIONS

2007 Publications

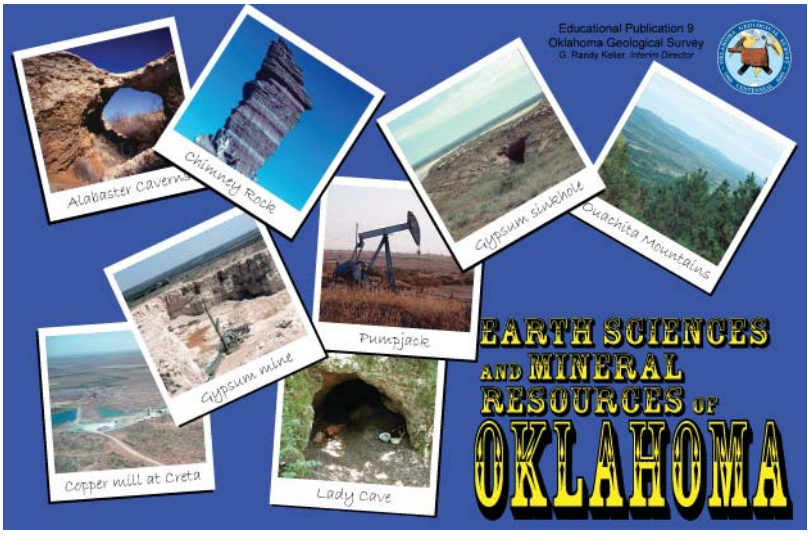
- Oklahoma Geology Notes, Vol. 66, No. 2, Summer 2006. March 8, 2007.
- Oklahoma Geology Notes, Vol. 66, No. 3, Fall 2006. July 27, 2007.
- Oklahoma Geology Notes, Vol. 66, No. 4, Winter 2006. Aug. 31, 2007.
- Bulletin 149. Trilobite Biostratigraphy and Correlation of the Kindblade Formation (Lower Ordovician) of Carter and Kiowa Counties, Oklahoma, by James Douglas Loch. September 26, 2007.

2008 Publications

- Oklahoma Geology Notes, Vol. 67, No. 1, Spring 2007. Jan. 9, 2008.
- Oklahoma Geology Notes, Vol. 67, Nos. 2–4, Summer, Fall, Winter 2007. July 23, 2008.
- Educational Publication 9. Earth Sciences and Mineral Resources of Oklahoma. July 3, 2008.
- Information Series 12. Oklahoma Mineral Locality Index, by Arthur E. Smith, Jr., Robert O. Fay, and Joe Lobell. A reprint from *Rocks and Minerals*, Vol. 72, No. 4, July/August 1997. July 31, 2008.
- Oklahoma Geology Notes, Vol. 67, No. 2–4 (combined). July 23, 2008
- Circular 112A. Stratigraphic and Structural Evolution of the Ouachita Mountains and Arkoma Basin, Southeastern Oklahoma and West-Central Arkansas: Applications to Petroleum Exploration. 2004 Field Symposium. The Arbenz-Misch/Oles Volume, Neil H. Suneson, editor. November 2008.
- Guidebook 35. Guidebook to the Booch Sandstones: Surface to Subsurface Correlations, by Neil H. Suneson and Dan T. Boyd. November 2008.

For more information, call 405/325-1299 or visit www.ogs.ou.edu/pubs.php

Educational Publication 9: A Comprehensive Look at Oklahoma

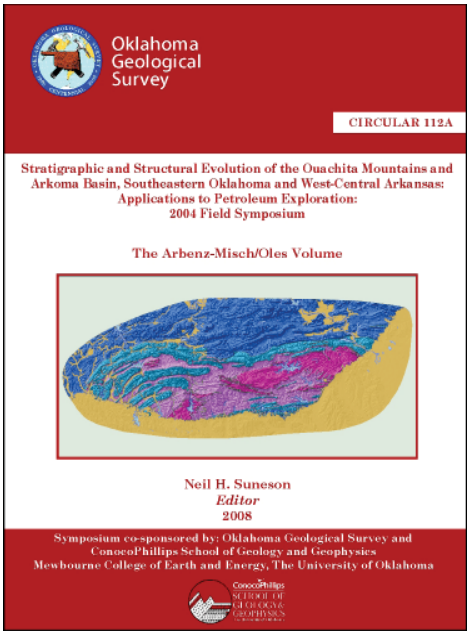


Earth Sciences and Mineral Resources for Oklahoma offers readers a generalized overview of the state and its natural resources. It is edited by Kenneth S. Johnson and Kenneth V. Luza. Copies are available from OGS publication sales and the contents can be viewed on the OGS Web site.

The oversized, 21-page publication contains text, maps, cross sections and illustrations that cover topography, geologic history, and the geomorphic provinces of Oklahoma as well as a general introduction, references and a glossary.

EP-9 provides a broad look at minerals and oil and gas resources, all of economic value. Other sections cover climate, vegetation, soils, lakes, rivers, streams, groundwater and earthquakes.

Landmark Ouachita Mountains Study Published in OGS Circular 112A



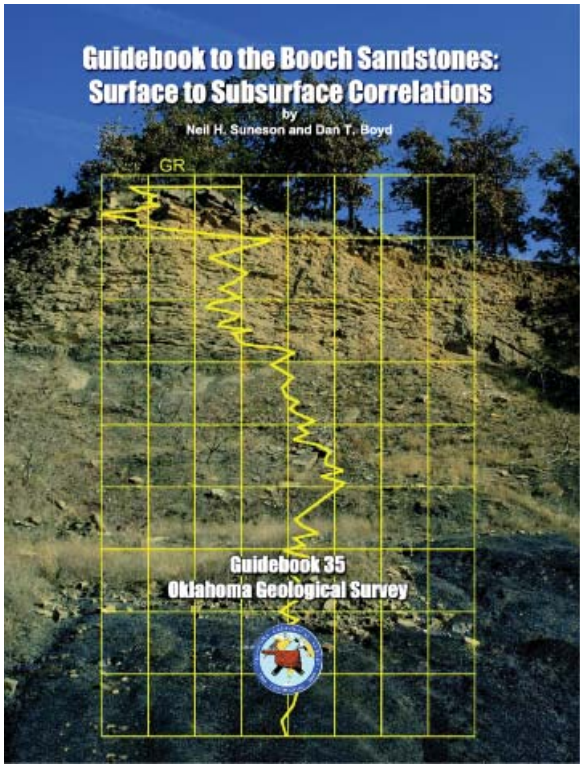
It is fitting that in its Centennial year the Oklahoma Geological Survey issued Circular 112A, *Stratigraphic and Structural Evolution of the Ouachita Mountains and Arkoma Basin, Southeastern Oklahoma and West-Central Arkansas: Applications to Petroleum Exploration: 2004 Field Symposium*, which contains J. Kaspar Arbenz's landmark study of the complex Ouachita Mountains of Oklahoma and Arkansas. Circular 112A combines older work by Peter Misch and Keith F. Oles with Arbenz's extensive field studies and new data to present an innovative and more complete look at the Ouachitas.

Along with the 86 pages of text and illustrations, Circular 112A includes nine oversized maps and cross sections that are provided on paper and on CD ROM.

Arbenz concludes in this study that large-scale horizontal displacement and local rotation of thrust sheets explain the surface and subsurface features observed on geologic maps and seismic data.

In addition to Arbenz's work, the paper by Misch and Oles is based on field work done in the 1950s for Union Oil Co. of California. This paper was the focal point for much controversy about the Ouachitas over the years, but its importance here lies in the historical perspective, insightful field observations, and detailed maps and cross sections.

New Guidebook 35 Details 19 Stops For Booch Gas Play Field Trips



The Survey's latest guidebook is a companion to OGS Guidebook 35: *Guidebook to the Booch Sandstones: Surface to Subsurface Correlations*. The book's purpose is to locate, identify and describe the best Booch sandstone outcrops in the Oklahoma part of the Arkoma Basin.

Authors Neil H. Suneson and Dan T. Boyd interpret the depositional environments of the strata and examine the outcrops based on lithologies, sedimentary structures, stratal disconformities and textural changes. They include gamma-ray profiles that approximate wireline gamma-ray logs in the subsurface. Parts of wireline logs from nearby wells show that, in some cases, the logs closely match, while at other times they differ greatly from the outcrop. The logs and outcrops are placed in the sequence-stratigraphic framework established for the entire Booch interval.

The Booch (pronounced *Boke*, like "*coke*") is the informal sub-surface term used by the oil and gas industry to identify certain sandstones in the Desmoinesian (Middle Pennsylvanian) McAlester Formation.

OGS STAFF LIST

G. Randy Keller	Interim Director	grkeller@ou.edu 405/325-7968

Geologists

Richard D. Andrews	Geologist IV	rdandrews@ou.edu 405/325-3991
Daniel T. Boyd	Geologist IV	dtboyd@ou.edu 405/325-8898
Raymon L. Brown	Geophysicist III	raybrown@ou.edu 405/325-8954
Brian J. Cardott	Geologist IV	bcardott@ou.edu 405/325-8065
Julie Chang	Geologist II	jmchang@ou.edu 405/325-7055
James R. Chaplin	Geologist IV	jchaplin@ou.edu 405/325-8071
Stanley T. Krukowski	Geologist IV	skrukowski@ou.edu 405/325-8033
Kenneth V. Luza	Geologist IV	kluza@ou.edu 405/325-8037
Thomas M. Stanley	Geologist IV	tmstanley@ou.edu 405/325-7281
Neil H. Suneson	Geologist IV	nsuneson@ou.edu 405/325-7315

Technical and Outreach

James H. Anderson	Manager, Cartography	jima@ou.edu 405/325-3035
Sue Britton Crites	Editor, Oklahoma Geology Notes	scrites@ou.edu 405/325-8076
Laurie A. Lollis	Graphics Presentation Technician	lollis@ou.edu 405/325-8035
Richard G. Murray	Copy Center Operator	rmurray@ou.edu 405/325-8054
Connie G. Smith	Marketing, Public Relations Specialist III	cgsmith@ou.edu 405/325-8021
Paul E. Smith	Supervisor, Copy Center	pjsmith@ou.edu 405/325-8054
Russell Standridge	GIS Specialist	gstan@ou.edu 405/325-8056
Michelle J. Summers	Technical Project Coordinator	mjsummers@ou.edu 405/325-7313
Jane L. Weber	Database Coordinator	jlweber@ou.edu 405/325-7331

Administrative

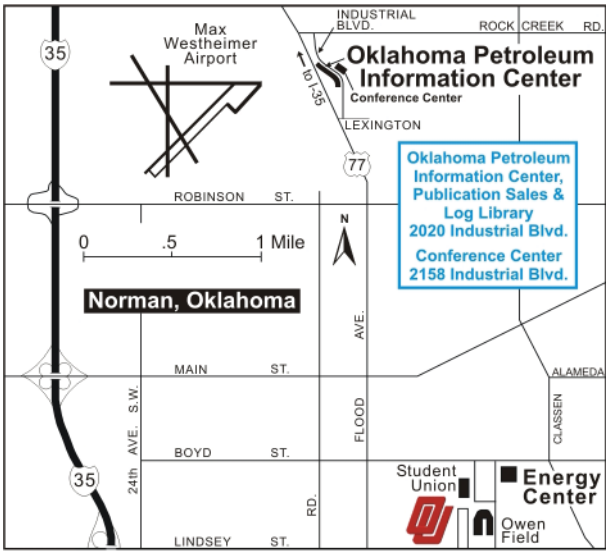
Betty D. Bellis	Staff Assistant III	bbellis-sge@ou.edu 405/325-3032
Shanika Bivines	Financial Administrator, Office Manager	nika@ou.edu 405/325-8014
Jennifer Veal	Staff Assistant II	jlveal@ou.edu 405/325-3031
Janise L. Coleman	Budget and Account Representative III	jlcoleman@ou.edu 405/325-3033
Tammie K. Creel-Williams	Administrative Assistant I	tcreel@ou.edu 405/325-3034

Oklahoma Petroleum Information Center

Charles R. Dyer III	Equipment Operations Maintenance IV	charles.r.dyer.III-1@ou.edu 405/325-1119
Vyetta Jordan	Lab Research Technician I	jordan@ou.edu 405/325-1169
Gene V. Kullmann	Manager, OPIC	kullmann@ou.edu 405/325-1279
Sue M. Palmer	Staff Assistant I	spalmer@ou.edu 405/325-1243
David O. Pennington	Facilities Attendant II	david.o.pennington-1@ou.edu 405/325-1299
Tom Sanders	Facilities Attendant II	405/325-1299
Joyce A. Stiehler	Shipping and Receiving Technician III	stiehler@ou.edu 405/325-1211

Geophysical Observatory

Amie R. Gibson	Research Specialist I	amiegibson@okgeosurvey1.gov 918/366-415
Jake Nance	Research Specialist	jake@okgeosurvey1.gov 918-366-4152



Oklahoma Geological Survey

http://www.ogs.ou.edu
ogs@ou.edu

Main Office
Sarkeys Energy Center
100 E. Boyd, Room N-131
Norman, Okla. 73019

Phone: 405/325-3031 or 800/330-3996
Fax: 405/325-7069

Oklahoma Petroleum Information Center (OPIC)
Publications Sales Office
2020 Industrial Blvd.
Norman, Okla. 73069

Phone: 405/325-1299
Fax 405/366-2882
E-mail: ogssales@ou.edu
Publications sales: www.ogs.ou.edu/pubs.php

Office hours: 8 a.m. to 5 p.m. weekdays

Created by the Oklahoma Territorial Legislature in 1890, the University of Oklahoma is a doctoral degree-granting research university serving the educational, cultural, economic and health-care needs of the state, region and nation. The Norman campus serves as home to all of the university's academic programs except health-related fields. Both the Norman and Health Sciences Center colleges offer programs at the Schusterman Center, the site of OU-Tulsa. The OU Health Sciences Center, which is located in Oklahoma City, is one of only four comprehensive academic health centers in the nation with seven professional colleges. OU enrolls more than 30,000 students, has more than 2,300 full-time faculty members, and has 20 colleges offering 158 majors at the baccalaureate level, 166 majors at the master's level, 81 majors at the doctoral level, 26 majors at the doctoral professional level, and 24 graduate certificates. The university's annual operating budget is $1.46 billion. The University of Oklahoma is an equal opportunity institution. (10/8/08)


OKLAHOMA GEOLOGICAL SURVEY
1908