

6-1992

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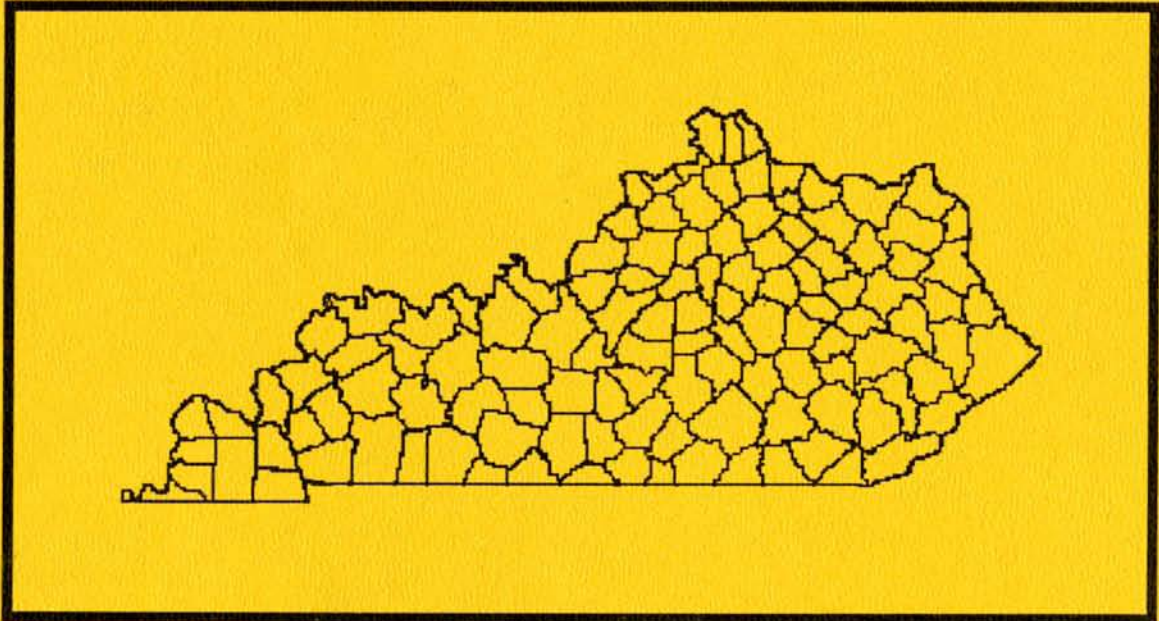
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Department of Geography and Geology
Western Kentucky University

Bowling Green, Kentucky 42101

Annual Report 1991



June, 1992

DEPARTMENT OF
GEOGRAPHY AND GEOLOGY

Annual Report
1991



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ACKNOWLEDGEMENTS

This report is dedicated to the faculty of the Department of Geography and Geology.

Special thanks to Ms. Betsy Lowrey and Ms. Lisa Frye for putting up with me these many years.

Wayne L. Hoffman

1991 IN REVIEW

Dear Reader:

Faculty excellence in teaching, research, and public service continued in 1991. During the past year, faculty published 20 articles, 22 technical and consulting reports, and 10 abstracts (Table 1). For the five year period 1987-1991, faculty published 111 articles, 118 technical and consulting reports, and 75 abstracts. In 1991 nine external grants valued at \$76,007 were obtained (Table 2). Over \$1,000,000 in external grants, contracts, and donated equipment was secured in the past five year period.

Students majoring and minoring in geography and geology continued to bring credit to the Department, College, and University. In 1991, students authored or co-authored 8 publications and presented 11 professional papers. For the five year period 1987-1991 students published 145 items and presented 85 professional papers. This is clearly an outstanding effort.

After many years of debate and conceptualization, I am happy to report that the faculty initiated a faculty/graduate student seminar during the Fall Semester. The seminar was initiated to increase student/faculty interaction, to serve as a vehicle to hear and discuss faculty and student research, and to encourage faculty and student development. Five seminars were held during the semester with four faculty and two student presentations. Details are included in this report.

Program enrollments (majors and minors) increased by 24% when comparing Fall 1990 to Fall 1991 data. Both the geography major and geology major experienced significant increases. The growing interest in the environment by this generation of students should spur greater enrollment in these dynamic areas. Undergraduate enrollment continued at a near record pace. Over 6,000 student credit hours were generated in each semester. The Department's student/faculty ratio of 26.8, while somewhat less than the 1990 figure, remains among the highest in the University.

Administratively, we have involved ourselves in outcomes assessment and other planning processes. During the Spring 1992 semester, all Departmental Alumni were surveyed concerning their reflections on the various program curriculums and their success in their chosen professions. While returns were limited, respondents were highly complimentary of the professors, curriculum, and facilities provided.

During the same period, we also launched a massive review of our undergraduate course offerings and program curriculum. Our work will continue into the next semester and will be reported in next year's Annual Report. Moreover, as part of the Western XXI process, we will be preparing a report on the Master of Science Degree in City and Regional Planning in June 1992. We are hopeful that the logic of our presentation and data will sway those administrators who have questions on the viability of this degree.

As we look to the next academic year (1992-93), the Southern Association Accreditation Departmental Review will take much of our energy. In addition, both the Geography major and Geology major will be reviewed by the Council on Higher Education during the cited period.

Other items of note during the past year include the passing of a new general education program by the Academic Council. We virtually had despaired that any action would be taken--curriculum brings out the best and worst of all academicians. Overall, the Department appears to

have fared well in the process, perhaps justifying the many years spent on the effort.

The University also experienced a shortfall in funding during the past year and will have limited funds available for the 1992-93 academic year. The budget for the Center for Local Government was terminated which will have significant implications in this and later years. Despite the shortfall, we were able to employ Ms. Mary C. Prante, a Ph.D. candidate from the University of Kansas to fill our open cartography position. She will replace Mr. Tom Feeney who temporarily filled this position. Mr. Feeney will be working on his Ph.D. in geography at the University of Georgia in the coming year.

We invite you to explore the remaining pages of this report. They document faculty dedication and productivity. As I complete my sixteenth year as department chair, I take pride in the faculty of this vital unit and the students we have sent into the professional workforce of the United States.

Wayne L. Hoffman
Department Chair

**DEPARTMENT OF GEOGRAPHY AND GEOLOGY
NONINSTRUCTIONAL ACTIVITIES 1987 - 1991
TABLE 1**

	1987	1988	1989	1990	1991	Total
Publications	16	32	22	21	20	111
Technical and Consulting Reports	20	9	28	39	22	118
Abstracts	12	28	16	9	10	75
Papers Presented	31	38	38	26	33	166
Attendance at Professional Workshops	27	21	15	7	7	77
Attendance at Professional Meetings	53	47	55	46	47	248
Positions in Professional Organizations	22	13	14	15	12	76
Grants and Fellowships	15	18	25	18	21	97
Student Papers Presented	17	23	21	13	11	85
Student Publications	13	48	43	33	8	145

**EXTERNAL GRANT, CONTRACT ACTIVITY AND
DONATED EQUIPMENT 1987 - 1991
TABLE 2**

School Year Funded	Number of Proposals	Number-Funded	Amount
1987	15	6	\$ 189,285
1988	8	7	\$ 272,632
1989	14	12	\$ 496,937
1990	10	8	\$ 32,899
1991	12	9	\$ 76,007
Total	59	42	\$ 1,067,760

FACULTY AND STAFF

S. Reza Ahsan, Ph.D. (Florida), Professor. Cartography, Air Photo, Remote Sensing, South Asia, Eastern Africa, Caribbean.

James M. Bingham, Ph.D. coursework (Indiana State), Assistant Professor. Economic, Location Theory, Planning.

Glen Conner, M.S. (Western Kentucky University), Associate Professor. Meteorology, State Climatologist.

Nicholas C. Crawford, Ph.D. (Clark), Professor. Hydrology, Groundwater, Karst Studies.

James L. Davis, Ph.D. (Northwestern), Professor. Urban, Transportation, North America.

Thomas P. Feeney, M.S. (Western Kentucky University), Instructor. Cartography, Hydrology.

Noland E. Fields, Jr., Ph.D. (Louisiana State), Professor. Environmental Geology, Sedimentary Geology, Paleontology.

Stuart Foster, Ph.D. (Ohio State), Assistant Professor. Quantitative Methods, Location Analysis, Geographic Information Systems.

Christopher G. Groves, ABD (University of Virginia), Instructor. Geomorphology, Hydrology.

Edmund E. Hegen, Ph.D. (Florida), Professor. Resources and Conservation, Rural Development, Latin America.

Wayne L. Hoffman, Ph.D. (Florida), Head, Professor. Urban, Economic, Planning.

Deborah W. Kuehn, Ph.D. (Pennsylvania State), Assistant Professor. Coal Geology, Organic Geochemistry, Palynology.

Kenneth W. Kuehn, Ph.D. (Pennsylvania State), Professor. Coal Geology, Coal Petrology, Geostatistics.

Mark Lowry II, Ph.D. (Syracuse), Professor. Urban, Social, Planning.

Jack D. McGregor, Ph.D. (Illinois), Professor. Mineralogy, Petrology, Petroleum Geology.

Conrad T. Moore, Ph.D. (U.C.L.A.), Professor. Resource Management, Biogeography, Environmental Perception.

Albert J. Petersen, Jr., Ph.D. (Louisiana State), Professor. Cultural Settlement Patterns, Historic Preservation.

Mary C. Prante, Ph.D. Candidate (University of Kansas), Instructor, Cartography, Physical Geography.

L. Michael Trapasso, Ph.D. (Indiana State), Associate Professor. Climatology, Geomorphology, Remote Sensing.

STRATEGIC PLAN SUMMARY

The following are the major strategic planning objectives listed for the 1991-92 academic year in the Department's Strategic Plan: 1989-1994.

Objective	Current Status
To review the undergraduate and the graduate curriculum.	The undergraduate review is underway--the graduate review will follow.
To create a computer skills laboratory separate from the office of the Kentucky State Climatologist.	Objective has been met.
To review and update departmental advising materials.	Will be initiated upon completion of the curriculum review.
To establish a team-taught senior level seminar as a vehicle for development of student skills.	No progress.
To establish a "Help Lab" for underprepared students in 100 level classes.	No progress.
To establish a visiting scholars program and departmental seminar.	Began - Fall 1991.

PRIORITY LIST OF EQUIPMENT AND REPAIR/MAINTENANCE NEEDS

A. Equipment List

Rank I

Sharp FO-300 Fax Machine/Printer w/modem	1,500
Talos Digitizer or CalComp 2000 Digitizer	12,000
Price AA Current Meter	1,600
New Clocks - stage recorders (2)	800
New Clocks - rain gauges (2)	240
Radon Test Equipment	10,000
Canon 35 mm camera w/flash and 50 mm lenses 5 @ 450	2,250
Brunton pocket transits	700
High volume roll film Laminator ARL 25"	995
KY-US Topographic Sheets	1,500
Continent relief maps	900
World Relief Maps	600
Wall maps	2,000
Planix 5000 digital planimeter	1,250
Map reproducer system (Minolta/Canon) 30"	6,000
Krones LZK optical drafting system	13,000
Automatic rock thin sectioner	21,000
Photometer w/readout capacity	6,000
LaCost Ramberg D Microgravity Meter	34,000
Zoom transfer scope	18,500
Aerial/Space photos	1,500
Optical scanner	1,000
Manometer stage recorders (2)	8,000
Petrographic microscopes (5)	25,000
Max Cadliner CD-750 w/letter modules	2,150
Automatic Water Samplers	25,000
UV Light w/cabinet	550
Cave radio	500
Weighing/Recording Rain Gauge	1,475
Parallax Bar w/digital micrometer processor	920
Vacuum frame flip-top plate maker	10,000
Wild range finder - 4 km range	1,750
Water Pumps (2)	2,000
Steven type F stage recorders	8,000
Ph meter	400
Conductivity meter	400
X-ray machine	16,000
Department Vehicle	<u>18,000</u>
Rank I Subtotal	\$ 257,480

Rank II

Wind Velocity/Direction Recorder	\$ 5,600
Automatic Weather Station	3,000
Satellite Graphics System	27,000
Deep Rock Drilling Rig	13,000
Hydrolab	3,000
Current Meter	1,600
Dissolved Oxygen Meter	1,100
Water Sensor	<u>2,500</u>
Rank II Subtotal	\$ 56,800
Grand Total Equipment	\$ 314,280

B. Repair/Service/Preventive Maintenance

Rank I

Geophysics Instruments Service	\$ 1,000
Electric Tape	400
TV/VCR	250
General Instrument Repair/Service	2,200
Conductivity Meter Repair	1,000
Cal Comp Plotter Service	<u>500</u>
Total Service/Repair	\$ 5,350

EQUIPMENT LIST FOR 1991-92

During the past academic year, the department purchased \$ 6,186 of equipment and software out of the regular operating equipment budget. Two computers valued at \$5,656 were purchased from lapsed salary money. Finally, \$7,092 of equipment and software were purchased from grant and contingency funding. A listing of the equipment purchased follows:

2400 Internal Modem	2	98.00
ZM-2401 Zenith ZM2401 External Modem-2400 Band	1	139.00
M1707LL/A MacIntosh LCII 4 mb, 80 mb, hard drive, w/VRAM	3	1,313.00
MO297LL/C MacIntosh 12" RGD Monitor	3	1,095.00
MO312 Extended Keyboard	3	480.00
M0444 Aple IIe Card	3	369.00
722300 IC Pen Tarret fon 1020 Series & Pens		210.00
IDRISI (raster GIS)	2	560.00
OKIDATA Microline 380 Printer	1	231.00
Gateway 2000 486 DX/33 H2-IBM Compatible	2	5,470.00
Tractor Feed Unit - ML 193 Plus	1	102.00
M-Line 293 Space Motor Assembly	1	117.00
Sample Thematic Mapper-Floppy Disk (New Orleans)	1	250.00
45851 - CD Rom Drive	1	498.00
M0364LL/B MacIntosh II SI, 5 mb RAM, 80mb Hard Disk	2	4,138.00
M0401LL/B Applecolor High Resolution RGB Monitor	2	1,218.00
M0312 Apple Extended Keyboard II	2	320.00
OKIDATA Microline Printer	1	250.00
Calcomp 1025 plotter (maintenance contract)	1	506.00
Tinopal 5 BMGX Dye	80 lbs.	516.00
Rhodamine WT Dye	50 lbs.	900.00
Total Hardness & Calcium as CaCO ₃	1	154.00
Model HAC-DT	1	154.00

FACULTY PUBLICATIONS

- Conner, Glen. "Kentucky Floods and Droughts," co-author with Kevin J. Ruhl and A.L. Smothers, in National Water Summary, U.S. Geological Survey Water Supply Paper 2375, U.S. Geological Survey, 1991.
- Conner, Glen. "Century of Climate at Non-Urban Stations," Geography Section, 1990 Proceedings, Kentucky Academy of Science, 1991, pp 322-39.
- Crawford, N.C., "Lithologic Control of Shallow Karst Groundwater Flow on the Sinkhole Plain of Kentucky, " (with Christopher G. Groves), National Speleological Society Bulletin, 52, December 1990, 57-69 pp.
- Crawford, N.C., Environmental Hydrogeology of Karst Terranes in the Vicinity of Nashville, Tennessee (eds. with Geary M. Schindel, Elwin D. Hannah, John F. Hoffelt and James F. Quinlan). Guidebook for Third Conference on Hydrogeology, Ecology, Monitoring and Management of Ground Water in Karst Terranes, sponsored by U.S. Environmental Protection Agency and National Ground Water Association, Nashville, Tennessee, December, 1991, 87 p.
- Crawford, N.C., "Karst Hydrogeology of the Snail Shell Karst and Tennessee's Proposed Site for the Superconducting Super Collider," (with Patricia J. Thompson, Ray C. Gilbert, and Randy L. Villa) in Schindel, Hannah, Crawford, Hoffelt and Quinlan (eds.), Environmental Hydrogeology of Karst Terranes in the Vicinity of Nashville, Tennessee. Guidebook for Third Conference on Hydrogeology, Ecology, Monitoring and Management of Ground Water in Karst Terranes, sponsored by U.S. Environmental Protection Agency and National Ground Water Association, Nashville, Tennessee, December, 1991, pp. 69-82.
- Crawford, N.C., "Site of Dye Traces in Progress to Find the Source of Trichloroethylene in Two Water Wells, " in Schindel, Hannah, Crawford, Hoffelt and Quinlan (eds.), Environmental Hydrogeology of Karst Terranes in the Vicinity of Nashville, Tennessee , Guidebook for Third Conference on Hydrogeology, Ecology, Monitoring and Management of Ground Water in Karst Terranes, sponsored by U.S. Environmental Protection Agency and National Ground Water Association, Nashville, Tennessee, December, 1991, p. 87.
- Crawford, N.C., "Site of Train Wreck Near Lewisburg, Tennessee Which Resulted in the Release of Over 15,000 Gallons of Chloroform (DNAPL) and 4,000 Gallons of Styrene (LNAPL) into a Karst Aquifer," in Schindel, Hannah, Crawford, Hoffelt and Quinlan (eds.), Environmental Hydrogeology of Karst Terranes in the Vicinity of Nashville, Tennessee. Guidebook for Third Conference on Hydrogeology, Ecology, Monitoring and Management of Ground Water in Karst Terranes, sponsored by U.S. Environmental Protection Agency and National Ground Water Association, Nashville, Tennessee, December, 1991, pp. 84-86.
- Davis, James L. "British Rail InterCity Service: A Geographic Appraisal." Kentucky Academy of Science 1990 Proceedings, Geography Section , November, 1991, pp. 11-21,
- Foster, S.A. and others, "Evaluation of Federal Policies on the Supply of Physicians: Application of Nonparametric Expansion Methods," in Applications of the Expansion Method, edited by E. Casetti and J.P. Jones, III. London: Routledge, 1992, pp. 95-111.

- Foster, S.A., "Perspectives on Different Paradigms," The Professional Geographer, Vol. 43 1991, p. 527-8.
- Foster, S.A., "The Expansion Method: Implications for Geographic Research," The Professional Geographer, Vol. 43, 1991, p. 131-42.
- Foster, S.A. and J.P. Jones, III. "Testing Regression Residuals for Spatial Autocorrelation," Geographer Research Forum, No. 143, 1991, p. 78-83.
- Groves, C.G. and N.C. Crawford, "Lithologic Control of Karst Groundwater Flow on the Sink-hole Plain of Kentucky," Bulletin of the National Speleological Society, vol. 52, 1990, pp. 57-69.
- Groves, C.G., 1991, "Early Development of Karst Systems: Preliminary Simulation Modeling Results," Cave Research Foundation Annual Report, 1990, pp. 36-37.
- Hoffman, Wayne L (with Thomas Tweddell). "Landuse in Russellville, Kentucky: 1988 - 2020," 1990 Proceedings, Geography Section, Kentucky Academy of Science, 1991, pp. 1-11.
- Kuehn, D.W. and Davis, A., "Effects of Coalification and Paleoenvironment on Aliphatic and Aromatic CH Contents in the Lower Kittanning Coal Seam," Journal of Organic Geochemistry, pp. 11-21, 17, 1991, pp. 255-262.
- Lowry, Mark. "Argentina's Madres de Plaza de Mayo: Relentless Persistence - Lingering Hope," Global Justice, Vol. 2, No. 3, Sept/Oct 1991, pp. 10-11.
- Moore, Conrad T., (with Barry A. Vann), "Factors Affecting Wood Fuel Consumption in Warren County, Kentucky." 1990 Proceedings, Geography Section, Kentucky Academy of Science, 1991, pp. 23-31.
- Moore, Conrad T., editor, 1990 Proceedings, Geography Section, Kentucky Academy of Science, 1991, 64 p.
- Trapasso, L. Michael, 1991, "Candomblé: An Afro-Brazilian Religious Cult," 1990 Proceedings, Geography Section, Kentucky Academy of Science, 1991, pp. 59-64.

TECHNICAL REPORTS

- Conner, Glen. "Tornadoes in Kentucky 1950-1989," Kentucky Climate Center Publication Number 27, 1991, 4 p.
- Conner, Glen. "Climate of Bowling Green 1961-1990," Kentucky Climate Center, 1991, 4 p.
- Conner, Glen. "Climate of Scottsville 1961-1990," Kentucky Climate Center, 1991, 4 p.
- Conner, Glen. "Climate of Kentucky," Kentucky Climate Center, 1991, 4 p.
- Crawford, N.C., "Karst Hydrogeology Investigation of the Fort Hartford Mine Site, Olaton, Ohio County, Kentucky," (with Ginny Gray), prepared for Environmental and Safety Designs, Inc., January, 1991, 45 p. and 4 plates.
- Crawford, N.C., "Preliminary Karst Hydrology Investigation of the Proposed Site for the Sumner County, Tennessee Demolition/Construction Debris Landfill," prepared for Sumner County Resource Authority and Larry McClanahan, Environmental and Development Consultant, January, 1991, 3 p.
- Crawford, N.C., "Revised Groundwater Monitoring Plan for a Proposed Petroleum Waste By-products Land-treatment Facility, Triple M Farms, Simpson County, Kentucky" (with James H. Smith), prepared for North American Environmental Services, Inc., February, 1991, 11 p.
- Crawford, N.C., "Preliminary Karst Hydrogeologic Investigation of the Proposed Site for the Advanced Technology Center, Morgantown Road and Loop Drive, Bowling Green, Kentucky," (with James H. Smith), prepared for Smith and Associates, March, 1991, 155 p.
- Crawford, N.C., "Preliminary Karst Hydrogeologic Investigation of the Proposed Site for an Apartment Complex between Fitzgerald Drive and U.S. 31W, Bowling Green, Kentucky," prepared for James R. Adams and Associates, Civil Engineers and Land Surveyors, April, 1991, 15 p.
- Crawford, N.C., "Karst Groundwater Flow in the Vicinity of Thomas Industries, Inc., Hopkinsville, Kentucky," (with Mike Horsley, Bill Howcroft, Jim Smith and Mark Gottlieb), prepared for Dames and Moore and Thomas Industries, Inc., September, 1991, 92 p. and 20 plates.
- Crawford, N.C., "Karst Groundwater Flow in the Vicinity of the Ned Gray Toxic Waste Site and Blue Lake Quarry, Hopkinsville, Christian County, Kentucky," (with Britton Dotson, Mike Horsley, and Brad Stevenson), prepared for O.H.M. Corporation and U.S. Environmental Protection Agency, September, 1991, 41 p. and 3 plates.

- Crawford, N.C., "Groundwater Flow in the Vicinity of the CSX Train Derailment near Lewisburg, Marshall County, Tennessee," prepared for CSX Transportation and ERC Environmental Energy Services Company, October, 1991, 81 p.
- Crawford, N.C., "Dye Traces to Determine if Leachate from the Curtis Peay Landfill is Contaminating the Joseph Schultz Water Well," (with James Smith), December 1991, 12 p.
- Foster, S.A. (with Wayne L. Hoffman and Thomas Tweddell), "Expansion of the Fairview Avenue Branch of the American National Bank." Prepared by the Center for Local Government, Institute for Economic Development, Western Kentucky University, 1991, 38 p.
- Foster, S.A. (with Wayne L. Hoffman and Thomas Tweddell), "Expansion of the Russellville Road Branch of the American National Bank." Prepared by the Center for Local Government, Institute for Economic Development, Western Kentucky University, 1991, 39 p.
- Hoffman, Wayne L. "Expansion of the Russellville Road Branch of the American National Bank: A Location Analysis," (with Stuart Foster and Thomas Tweddell), Center for Local Government, Western Kentucky University, 1991, 38 p.
- Hoffman, Wayne L. "Expansion of the Fairview American Branch of the American National Bank: A Location and Site Analysis," (with Stuart Foster and Thomas Tweddell), Center for Local Government, Western Kentucky University, 1991, 39 p.
- Hoffman, Wayne L., editor, "The 1992 BRADD Data Book," Center for Local Government, 1991 219. p.
- Kuehn, Kenneth W. "Characterization of Liquefaction Residues from the Black Thunder Coal." Submitted to AMOCO Research Center, Naperville, IL, 5 p.
- Kuehn, Kenneth W. "Precision and Reproducibility of Maceral Analysis." Final Report of the Research Subcommittee. Submitted to Council of the Society for Organic Petrology, Carrollton, Texas, 17 p.

ABSTRACTS

- Davis, James L. and Nancy H. Davis, "Imaginary Towns and their Prototypes: Two Case Studies," Abstracts, Popular Culture Association National Meeting, 1991, p. 152.
- Davis, James L. "Developing Geography Faculty for Public Service Activities: A Case Study," (with Wayne L. Hoffman), Association of American Geographers Annual Meeting Program and Abstracts, 1991: 44-45.
- Fields, Noland E., "Using Global Themes in Geology Courses for Earth Science Teachers." Geological Society of America Abstracts, Vol. 23, no. 5, 1991, p. A129.
- Groves, C.G. and A.D. Howard, "Early Development of Karst Flow Systems: Preliminary Simulation Modeling Results," Eos, Vol 72, 1991: 136.
- Groves, C.G. and C.M. Wicks. "Chemical Evolution of an Acid Mine Drainage Stream in Karst Terrain," Eos, Vol. 72, 1991: 114.
- Hoffman, Wayne L. "Developing Geography Faculty for Public Service Activities: A Case Study," (with James Davis), Association of American Geographers Annual Meeting Program and Abstracts, 1991: 44-45.
- Kuehn, K.W., Hower, J.C., and Wild. G. "Counting Error in Petrographic Analysis: Examples from Coal Petrography," 77th Annual Meeting of the Kentucky Academy of Science, Geology Section Program and Abstracts, 1991: 1.
- Moore, Conrad, "The Geographical Dynamics of Great Plains Drought, 1895-1990," Association of American Geographers Annual Meeting Program and Abstracts, 1991: 229.
- Rovai, Eugenie, "Common Problems of Spatial Analysis and Resource Management, Association of American Geographers Annual Meeting Program and Abstracts, 1991: 174.
- Trapasso, L. Michael, "Oil Production on the Alaskan Tundra: Environmental and Wildlife Conservation Efforts," Association of American Geographers Annual Meeting Program and Abstracts, 1991: 200.

PAPERS PRESENTED

- Ahsan, S. Reza. "Pattern of Human Geography in an Indian Villiage," Kentucky Academy of Science Annual Meeting, Owensboro, Kentucky, November, 1991.
- Ahsan, S. Reza. "Indian Settlements in Trinidad, West Indies," National Association of Geographers (NAGI), Patna, India, December, 1991.
- Conner, Glen, "A Decade of Climatology in Kentucky," American Association of State Climatologists Annual Meeting, Anchorage, Alaska, August, 1991.
- Conner, Glen, "Who Uses Climatological Data?" Kentucky Academy of Science Annual Meeting, Owensboro, November, 1991.
- Crawford, N.C., "Groundwater Contamination from Spills of Hazardous Liquids Upon Karst Terrane," Kentucky Academy of Science Annual Meeting, Owensboro, November, 1991.
- Crawford, N.C., (with Thomas Feeney), "Mechanisms Responsible for Sinkhole Flooding," Kentucky Academy of Science Annual Meeting, Owensboro, November, 1991.
- Crawford, N.C., (with William Howcroft), "Springhead Protection Study of the Shakertown, Summers, and Auburn Springs Groundwater Basins, Logan and Simpson Counties, Kentucky," Kentucky Academy of Science Annual Meeting, Owensboro, November, 1991.
- Crawford, N.C., "Emergency Response Procedures for Spills of Hazardous Liquids upon Karst Terranes," Third Conference on Hydrogeology, Ecology, Monitoring and Management of Ground Water in Karst Terranes, sponsored by the National Ground Water Association and U.S. Environmental Protection Agency, Nashville, Tennessee, December, 1991.
- Crawford, N.C., (with Ginny Gray) "Application of Dye-Tracing Techniques for Characterizing Ground Water Flow Regimes at the Fort Hartford Mine Superfund Site, Olaton, Ohio County, Kentucky," Third Conference on Hydrogeology, Ecology, Monitoring and Management of Ground Water in Karst Terranes, sponsored by National Ground Water Association and U.S. Environmental Protection Agency, Nashville Tennessee, December, 1991.
- Crawford, N.C., (with Britton Dotson and Mark Rigatti), "The Use of Groundwater - Level Measurements and Dye Tracing to Determine the Route of Groundwater Flow from a Hazardous Waste Site in an Area of Karst in Hardin County, Kentucky," Third Conference on Hydrogeology, Ecology, Monitoring and Management of Ground Water in Karst Terranes, sponsored by National Ground Water Association and U.S. Environmental Protection Agency, Nashville Tennessee, December, 1991.
- Davis, James L. and Nancy H. Davis, "Imaginary Towns and Their Prototypes: Two Case Studies," National Meeting, Popular Culture Association, San Antonio, Texas, March 1991.

- Davis, James L. and Wayne L. Hoffman, "Developing Geography Faculty for Public Service Activities: A Case Study," National Meeting, Association of American Geographers, Miami, Florida, April 1991.
- Davis, James L. and Nancy H. Davis, "Urban Places and Literary Influences," Kentucky Academy of Science Annual Meeting, Owensboro, November 1991.
- Feeney, T.P. and N.C. Crawford, "Mechanisms Responsible for Sinkhole Flooding," 77th Annual Meeting, Kentucky Academy of Science, Owensboro, November, 1991.
- Fields, Noland, "Using Global Themes in Geology Courses for Earth Science Teachers," Annual Meeting, Geological Society of America, San Diego, California, October, 1991.
- Foster, S.A. "GIS: Realizing the Possibilities," Governor's Conference on Local Issues, Louisville, Kentucky, June, 1991.
- Groves, C.G., "Simulation Modeling of Early Karst Development," (with A.D. Howard) , National Speleological Society Annual Meeting, Cobleskill, New York, June, 1991.
- Groves, C.G., (with Carol Wicks), "Chemical Evolution of an Acid-mine Drainage Stream in Karst Terrain," National Speleological Society Annual Meeting, Cobleskill, New York, June, 1991.
- Groves, C.G. (with C.M. Wicks), "Environmental Impacts of Acid-Mine Drainage on Karst Terrain," National Cave Management Symposium, Bowling Green, KY, October, 1991.
- Groves, C.G., "Oddballs of the Karst: Kentucky Rivers that Flow Backward," Kentucky Academy of Science Annual Meeting, Owensboro, Kentucky, November 1991.
- Groves, C.G., "Early Development of Karst Systems: Preliminary Simulation Modeling Results," (coauthored with A.D. Howard), American Geophysical Union Spring Meeting, Baltimore, MD, May, 1991.
- Hegen, E.E. "The Andes: Environments and Peoples." Keynote lecture presented at University of Alabama/Tuscaloosa Latin American Studies Program Seminar: The Acan World, January, 1991.
- Hoffman, Wayne L. "Developing Geography Faculty for Public Service Activities: A Case Study," (with James Davis), Association of American Geographers Annual Meeting, Miami, Florida, April, 1991.
- Kuehn, D.W., 1991, "A Continuous Holocene Sea-Level Rise: Evidence from Southwest Florida," Kentucky Academy of Science Annual Meeting, Owensboro, November, 1991.

- Kuehn, K.W., "Counting Error in Petrographic Analysis: Examples from Coal Petrography," (with others), Kentucky Academy of Science Annual Meeting, Owensboro, November 1991.
- Lowry, Mark. "Chota: All-Black Pueblo in the Andes of Ecuador," Midwestern Association of Latin American Studies, Cedar Falls, Iowa, October, 1991.
- Lowry, Mark. "Argentina's Mothers of Courage," Annual Meeting, Kentucky Academy of Science, Owensboro, November, 1991.
- Moore, Conrad T., "The Geographical Dynamics of Great Plains Droughts, 1895-1990," Annual Meeting, Association of American Geographers, Miami, Florida, April, 1991.
- Moore, Conrad T., "The Fire-Origin of Grasslands Re-examined," Annual Meeting, Kentucky Academy of Science, Owensboro, November, 1991.
- Rovai, Eugenie, "Common Problems of Spatial Analysis and Resource Management," National Meeting, Association of American Geographers, Miami, Florida, April, 1991.
- Trapasso, L. Michael, "Environmental Impacts of Oil Production on the Alaskan Tundra," National Meeting, Association of American Geographers, Miami, Florida, April, 1991.
- Trapasso, L. Michael, "Saving the Other Rainforest: S.O.S. Fundação Mata Atlântica," Kentucky Academy of Science Annual Meeting, Owensboro, November, 1991.
- Trapasso, L. Michael, "Temperature Trends in the Southeastern United States from 1936 to 1985," Southeastern Division of the Association of American Geographers, Asheville, North Carolina, November 1991.

INTERNAL GRANTS RECEIVED - 1991

Name	Source	Purpose	Amount
Reza Ahsan	WKU Faculty Development Grant	Travel	\$ 400
James Davis	WKU Faculty Development Grant	Travel	\$ 200
James Davis	President's Unrestricted Funds Grant	Travel	\$ 360
Noland Fields	WKU Faculty Development Grant	Travel	\$ 250
Chris Groves	WKU President's Unrestricted Grant	Travel	\$ 378
Kenneth Kuehn	WKU Faculty Development Grant	Travel	\$ 212
Mark Lowry	WKU President's Unrestricted Grant	Travel	\$ 2,000
Conrad Moore	WKU Faculty Development Grant	Travel	\$ 200
Eugenie Rovai	WKU Faculty Development Grant	Travel	\$ 225
L. Michael Trapasso	WKU Faculty Development Grant	Travel	\$ 150
L. Michael Trapasso	President's Unrestricted Funds Grant	Equipment	\$ 483
		TOTAL	\$ 4,858

EXTERNAL GRANTS AND EQUIPMENT RECEIVED - 1991

Project Name	Director/Author	Funding Agency	Value
Saint Maur's (Shaker-town) Springhead Protection Area Delineation Project Logan County, Kentucky	Nicholas Crawford	Kentucky Division of Water	\$12,107
Community Health Indicators	Stuart Foster	South Central Kentucky Area Health Education Center	\$ 1,600
BRADD Data Book Revision	Wayne L. Hoffman	Barren River Development District	\$ 7,500
Comprehensive Plan Revision	Wayne L. Hoffman	Franklin/Simpson County	\$19,500
Comprehensive Plan Revision	Wayne L. Hoffman	Logan County	\$ 8,000
Bank Location Studies	Wayne L. Hoffman	American National Bank	\$ 4,000
External Travel Grant	Kenneth Kuehn	Society for Organic Petrology	\$ 300
Study in Egypt and the Gulf States	Mark Lowry	Joseph J. Malone Fellowship	\$10,000
Summer Geography Institute for Teachers K-12	Albert Petersen	National Geographic Society	\$13,000
		TOTAL	\$76,007

SERVICE TO PUBLIC SCHOOLS AND TEACHERS

- S. Reza Ahsan -International Days
 -Science Days
- Jim Bingham -Science Fair Judge, Hart County High School
- Glen Conner -"Quakes, Science, and Greenhouses," Governor's Scholars, Kentucky
 State University, Frankfort, June, 1991
 -Allen County Middle School's TOPS class, March, 1991
 -Awesome Academic Showdown, Allen County High School, April 1991
 -"Use of Weather in the Classroom," Geography Teachers' Summer
 Workshop
 -International Days
 -Science Days
- Nick Crawford -"Karst Environmental Problems and Continuation in Bowling Green
 Area," field trip for Geography Teachers' Summer Workshop
 -Science Days
- Jim Davis -Judge, Kentucky Geography Bee, Louisville
 -International Days
- Noland Fields -Bowling Green High School, Science Fair Judge, March 1991
 -Green County High School, Earthquake Presentation, April 1991
 -West Hardin Middle School, "Writing About the Earth," October 1991
 -McNeill Elementary School, Rocks and Minerals Presentation, Dec. 1991
 -School Consultant, West Hardin Middle School & McNeill Elementary
 -Science Days
- Stuart Foster -Science Days
- Chris Groves -Science Days
- Edmund Hegen -Science Days
- Wayne Hoffman -Judge, Geography Bee, University of Louisville, April 1991
 -Science Days
 -International Days
- Debbie Kuehn -T.C. Cherry Elementary School, Spoke to 3rd grade classes on karst to-
 pography
 -McNeill Elementary School, Took 4th grade class on a campus field trip
 to study limestones and building stones
 -Science Days

- Kenneth Kuehn -Judge - Southern Kentucky Regional Science Fair - March, 1991
 -Butler County Middle School - presentation on Earthquakes for Geography Awareness Week
 -Science Days
- Jack McGregor -Science Days
- Mark Lowry -Science Days
 -International Days
- Conrad Moore -Science Days
 -International Days
- Albert J. Petersen -Moderator, Kentucky Geography Bee, Louisville, Kentucky
 -Kentucky Historical Society Teacher Excellence Program. "The Hensley Settlement," Cumberland Gap National Park
 -Director, Summer Institute for Teachers, National Geographic Society
 -Co-coordinator, Kentucky Geographical Alliance
 -Prepared a "Student Atlas of North America" for distribution to schools
 -Assisted in developing a Teacher's Resource Guide titled, "From Here . . . to There, A Geographical Perspective of Kentucky within the World"
- L. Michael Trapasso -Presentation, Lincoln Elementary School, Franklin, Kentucky
 -Panel Discussant, FBLA Conference, WKU Campus
 -Career Day, Glasgow High School
 -Presentation, Bullitt County High School
 -Guest Lecturer, Middle School Academics, Gifted Summer Camp
 -Presentations, Franklin Simpson High School
 -Science Days
 -International Days
 -Tour of College Heights Weather Station, Franklin Simpson High School
 -Science Club
 -Consultant, McNeill Elementary School PTA
 -Presentation, Morgantown Junior High School

FACULTY ATTENDANCE AT PROFESSIONAL MEETINGS

*Participated in the meeting as a paper presenter, chairperson of a session or in some other professional manner.

National Geographic Society Education Program, New Orleans, January, 1991. Petersen*.

Latin American Studies Program Seminar, University of Alabama/Tuscaloosa, January, 1991. Hegen*.

United States Department of Energy, Reviewer's Meeting, University Coal Research Program, Pittsburgh, PA, March, 1991. K. Kuehn*.

Popular Culture Association Meeting, San Antonio, March 1991. Davis*.

Association of American Geographers, Miami, April, 1991. Davis*, Hoffman*, Moore*, Rovai*, Trapasso*.

American Geophysical Union, Spring Meeting, Baltimore, April 1991. Groves*.

Simple Days, University of Kentucky, April 1991. Hoffman, Petersen.

Governor's Local Issue Conference, Louisville, June 1991. Foster*, Hoffman*.

National Association of Regional Councils, Atlantic City, June 1991. Hoffman.

National Speleological Society Annual Meeting, Cobleskill, NY, June 1991. Groves*.

The Kentucky Oil and Gas Association, Annual Meeting, Owensboro, June, 1991. K. Kuehn.

American Association of State Climatologists Annual Meeting, Anchorage, Alaska, Aug., 1991. Conner*.

Kentucky Council of Social Studies, Ft. Mitchell, September 1991. Hoffman, Petersen.

National Association of Towns and Townships, Washington, D.C., September 1991. Hoffman.

Midwestern Association of Latin American Studies, Cedar Falls, Iowa, October, 1991. Lowry*.

The Society for Organic Petrology, Annual Meeting, Lexington, KY, October, 1991, K. Kuehn*.

Geological Society of America, National Meeting, San Diego, October 1991. Fields*.

National Association of Development Organizations, Louisville, October 1991. Hoffman.

National Cave Management Symposium, Bowling Green, Kentucky, October, 1991, Crawford*, Groves*.

National Council for Geographic Education, St. Paul, October, 1991. Petersen*.

Kentucky Academy of Science, Owensboro, November, 1991. Ahsan*, Bingham, Conner*, Crawford*, Davis*, Feeney*, Groves*, Hoffman, D. Kuehn*, K. Kuehn*, Lowry*, Moore*, Trapasso*.

Malone Fellows of Egypt and the Gulf States, Center College, November 1991. Lowry*.

National Association of Science Teachers, Seattle/Vancouver, November 1991. Fields.

Southeast Division of the Association of American Geographers, Asheville, NC, November, 1991, Petersen*, Trapasso*.

Third Conference on Hydrogeology, Ecology, Monitoring and Management of Ground Water in Karst Terranes, Nashville, December, 1991. Crawford*.

"Trends in Kentucky," Legislative Research Commission, Louisville, December, 1991. Hoffman.

National Association of Geographers (NAGI), Patna, India, December, 1991. Ahsan*.

PROFESSIONAL WORKSHOPS ATTENDED

- S. Reza Ahsan -U.S. - Arab Foundation Workshop, Centre College, December, 1991.
- S. Reza Ahsan -Data User Workshop, U.S. Census, University of Louisville, November, 1991.
- Nick Crawford -Practical Karst Hydrogeology, with Emphasis on Groundwater Monitoring Course, presented by Association of Ground Water Scientists and Engineers, National Ground Water Association, Cave City, Kentucky, November, 1991.
- Nick Crawford -Kentucky Homebuilders Association, Radon Workshop, Louisville, January, 1991.
- Noland Fields -"The Earth Revealed," sponsored by the Geological Society of America, the Annenberg Foundation and The Corporation for Public Broadcasting, October 1991.
- Wayne L. Hoffman -GIS Workshop, Appalachia Regional Commission, Roanoke, VA, July 1991.
- Wayne L. Hoffman -Census Workshop, Urban Data Center and U.S. Census, Louisville, November, 1991.

FOREIGN TRAVEL BY FACULTY

- S. Reza Ahsan -Patna, India
- Chris Groves -England and Wales
- Mark Lowry -Egypt and Gulf States

POSITIONS HELD IN PROFESSIONAL ORGANIZATIONS

- James Bingham -Secretary, Geography Section, Kentucky Academy of Science
- Glen Conner -President-Elect, Sigma Xi Chapter of Western Kentucky University
- Nicholas Crawford -Associate Editor, Stygologia, International Journal of General and Applied Groundwater Research.
- James L. Davis -Chair, WKU Sigma Xi Club Nominating Committee
- Noland Fields -Campus Liaison Officer, Geological Society of America
- Wayne L. Hoffman -Chair, Public Relations and Awards Committee, Kentucky Planning Association
- Kenneth Kuehn -Chairman, Research Subcommittee, Society for Organic Petrology
-Councilor, Society for Organic Petrology
-Vice President, Geological Society of Kentucky
- Conrad Moore -Chair, Geography Section, Kentucky Academy of Science
- Albert Petersen -Kentucky Representative, SE Division of AAG
-Co-coordinator, Kentucky Geographic Alliance

SERVICE ON OFF-CAMPUS ADVISORY COMMITTEES

- Glen Conner -Water Availability Council, Kentucky Division of Water.
- Nick Crawford -Warren County Radon Action Committee.
-Planning Committee to establish a National Karst Waters Institute (KWI) in the United States.
-Planning Committee to establish the Kentucky Groundwater Consortium to be located at the University of Kentucky.
-Planning Committee to establish a park in the Lost River Cave Valley in Bowling Green - a joint venture between Friends of Lost River and Western Kentucky University.
-Board of Directors, Friends of Lost River.
-Board of Directors, Mammoth Cave National Park Organization.
- Noland Fields -State Commission, Governor's Earthquake Hazards Advisory Panel.
- Wayne Hoffman -BRADD Board of Directors.
-Chair, National Resources Committee, BRADD.
-Citizen Member, Ohio River Basin Committee.
-Member, Russellville Certified City Committee.
-Board of Directors, Mammoth Cave National Park Organization.
- Mark Lowry -Kentucky Committee on U.S. - Arab Relations.
- Albert Petersen -Member, Kentucky Historic Preservation Review Board--appointed by the governor.
-Member, USGS Board of Geographic Names, Kentucky Representative.

PROFESSIONAL PUBLIC SERVICE

- S. Reza Ahsan -Unpaid consultant for Aerial Photos and Satellite Data for several groups.
- Jim Bingham -Advisor/sponsor for Gamma Theta Upsilon, Geography Student Honor Society.
- Glen Conner -State Climatologist for Kentucky.
-Presentation to Lions Club, Springfield, Tn, June, 1991.
-Presentation of "Folklore Climatology," to Historical Society, Scottsville, September, 1991.
- Nick Crawford -Led Field trips for: Elderhostle, The Agricultural Environmental Technology Workshop, Local Boy Scout troops, The Soil Conservation Service, and The National Cave Management Symposium.
-Assisted several area individuals and compaines with environmental problems and issues, including dye traces, sinkhole collapses, sinkhole flooding, and radon.
-Talked to three service clubs.
-GEOClub Advisor.
-Considerable work and time on Lost River Project.
-Media interviews.
- James L. Davis -Kentucky State Geography, appointed by the Governor.
-Chair, Geography Section, National Meeting of the Popular Culture Association, San Antonio, Texas, March, 1991.
- Noland Fields -Several Presentations to area Civic Clubs concerning earthquakes and waste disposal.
-Several interviews with local news media.
-Assisted local residents concerning earthquakes, specimens, maps, and natural hazards.
-Book Review.
- Stuart Foster -One software package review and one book review.
- Chris Groves -Assisted local factory concerning land subsidence problems.
- E.E. Hegen -Unpaid consultant, Instituto Colombiano de Petroleo, Rural development in Department Arauca/Llano Orientales.
-Developed workshop for faculty and advanced students of Universidad Pedagogica/San Pedro Sula-Honduras.

- Wayne L. Hoffman -Several media interviews.
 -Moderator, Town Meeting, City Manager Form of Government, Oct. 1991.
 -Presentation to Chamber of Commerce, Franklin/Simpson County, Oct. 1991.
- Deborah Kuehn -Manuscript review.
 -Presentation to two 4-H clubs.
- Kenneth Kuehn -Review of Grant Proposal.
 -Manuscript review.
 -Geology Club Advisor.
- Mark Lowry -Lecture, WKU, "Observations on the Middle East: Travels in Egypt and the Gulf States," September, 1991.
 -Presented three talks on the Middle East to local civic and groups.
- Conrad Moore -Textbook review.
- Albert Petersen -Consultant to the Attorney General, Commonwealth of Kentucky on the Kentucky-Illinois Supreme Court Boundary Dispute.
- L. Michael Trapasso -Presentations to civic groups.
 -Consultant for area law offices, factories, insurance companies and television station.
 -Several media interviews.

UNIVERSITY AND COLLEGE COMMITTEE ASSIGNMENTS

Jim Bingham	-Faculty Senate, Ogden at-large Academic Affairs Committee
Glen Conner	-Ogden Dean's Advisory Committee, Spring 1991
James L. Davis	-Ogden College Representative, Academic Council -Ogden College Representative, Graduate Council -Vice Chair, Graduate Council -Graduate Faculty Committee of the Graduate Council -University-wide Yeager Scholarship Committee member -Chair, Graduate Program Evaluation Committee, SACS
Nick Crawford	-Ogden Research Scholarship Committee -WKU representative on Kentucky EPA/EPSCoR Planning Committee
Noland Fields	-Ogden College, Science/Math Education Committee -Ogden College, OAR Undeclared Student Advisory Committee
E.E. Hegen	-Chair, WKU Latin American Studies Committee -WKU International Education Committee
Wayne Hoffman	-Ogden College Curriculum Committee
Debbie Kuehn	-Ogden College Curriculum Committee
Kenneth Kuehn	-Faculty Senate -Chair, Faculty Status and Welfare Committee
Mark Lowry	-University Advisory Committee on Faculty Continuance -Chair, University Faculty Grievance Committee -Ogden College Graduate Committee -Ogden College Faculty Awards Committee -Ogden Sabbatical Committee
Conrad Moore	-United Way Committee -Canadian Studies Central Committee -Canadian Studies Curriculum Committee -University Honors Committee -Environmental Studies Committee
L. Michael Trapasso	-Graduate Council -Academic Council

MASTER'S DEGREES AWARDED - 1991

MASTER OF SCIENCE IN GEOGRAPHY

Fhahad M. Al Kolibi Dr. L. Michael Trapasso, advisor

Thesis Title: Regional Temperature Trends and Variations in the Contiguous United States from 1936 to 1985

Mike T. Brent Dr. Conrad Moore, advisor

Carl Britton Dotson Dr. Nicholas Crawford, advisor

Michael Cody Nichols Dr. L. Michael Trapasso, advisor

James Bradley Stephenson Dr. Nicholas Crawford, advisor

James William Webster Dr. Nicholas Crawford, advisor

Thesis Title: Radon Contamination of Residences in a City Built Completely upon a Karst Landscape: Bowling Green, Warren County, Kentucky

MASTER OF SCIENCE IN CITY AND REGIONAL PLANNING

Greg Langliers Dr. James L. Davis, advisor

Laura Pace, Dr. James L. Davis, advisor

Thesis Title: Analysis of East County Corridor, Daviess County, Kentucky

MASTER OF ARTS IN EDUCATION - GEOGRAPHY MAJOR

Dubon Jorge Rodriguez Dr. Mark Lowry, advisor

DEPARTMENT GRADUATES 1991

Geography Majors

David Alexander	Joe James
Kristi Baxley	Rodney Jones
Richard Bergen	Stephen Kellerman
Myra Brandon	Tammy Medlen
Gloria Bullock	Joseph Morgan
Robert Bybee	Paul Nichols
Michael Dant	Jeff Payne
John Dempsey	Timothy Puckett
Marcus Flippin	Randy Scoggins
Mark Freer	Ashley Willoughby
Kerry Givens	Hillari Wilson
Kiersten Jagers	

Geography Minors

Jeffrey Baker
Andrea Baldwin
Patricia Longmire
Gary Hanks
Barry Gresham
Lori Hampton
Christopher Johnson
Michael Meredith
Linda Mohon
Greg Pierce
Marty Smith
Blake Stallings
Tonya Wilson
Thomas Wortham

Earth Science Majors

Shellie Edwards

City and Regional Planning Minors

Richard Bergen
Gloria Bullock

Geology Majors

Jeffrey Baker
David Doyle
Chris Johnson
Greg Pierce

Geology Minors

Robert Bybee Jr.
Stephen Kellerman

Earth Science Minors

Eric Arteberry
Timothy Puckett

Michael Dant
Joe James

GRADUATE STUDENTS IN RESIDENCE 1991

M. Fahad Al-Kolabi, King Saud University
Curtis Barman, Western Kentucky University
Mike Brent, Western Kentucky University
Robert L. Bybee, Western Kentucky University
Michael Dant, Western Kentucky University
Julie Domian, University of Louisville
Carl Britton Dotson, Western Kentucky University
Robert Evans, Northern Kentucky University
Mark Freer, Western Kentucky University
Mark A. Gottlieb, University of Hartford
Greg Holzkneckt, Western Kentucky University
Mike Horsley, Western Kentucky University
William Howcroft, University of Massachusetts
Koichi Ino, Kyushio University
Kiersten Jagers, Western Kentucky University
Damon King, Western Kentucky University
Kelley Kalestsky, Averett College
Gregory L. Langeliers, South Dakota State University
Freida Moore, Morehead State University
Gary Mathis, Western Kentucky University
William T. Neisz, Western Kentucky University
Michael Nichols, University of Virginia
Melanie Neuber, Western Kentucky University
Steven H. Owens, Western Kentucky University
Laura E. Pace, Western Kentucky University
Scott Slunder, University of Evansville
James Smith, Tennessee Technological University
James Stephenson, University of the South
Stuart Douglas Stevenson, Western Kentucky University
Mark Turner, University of Cincinnati
David Whipple, Berea College
Jonathan Wood, University of Tennessee

UNDERGRADUATE ENROLLMENT DATA

Program Enrollment

There was an increase of 47 students in program enrollments when comparing Fall 1990 to Fall 1991 data (Table 3). This is a 24% increase. The Fall 1991 data reflect a resurgence of enrollment that was predicted in the 1990 Annual Report. A growing awareness of the environment and an improved job market for both geographers and geologists has generated this increase. In addition, some credit can be given our improved computer facilities in attracting new majors and minors. We project a modest increase of program enrollees in 1992--a total of 250 or more.

TABLE 3

HISTORICAL PERSPECTIVE

	Spr '88	Fall '88	Spr '89	Fall '89	Spr '90	Fall '90	Spr '91	Fall '91
Earth Science - Major	7	7	9	7	9	7	7	7
Geography - Major	73	73	66	72	74	83	92	94
Geology - Major	33	36	33	36	35	27	24	37
Earth Science - Minor	7	7	10	7	2	2	3	4
Geography - Minor	30	29	33	38	47	37	35	47
Geology - Minor	17	16	12	14	15	8	10	15
City and Regional Planning Minor	10	9	10	7	12	11	10	11
Cartography & Mapping Tecnology --Associate Degree	7	7	5	8	8	7	6	11
Meteorological Technology --Associate Degree	<u>20</u>	<u>23</u>	<u>20</u>	<u>17</u>	<u>21</u>	<u>10</u>	<u>8</u>	<u>13</u>
TOTAL	205	212	203	215	223	192	195	239

TABLE 4

PROGRAM GRADUATES
1989 - 1991

Please find below a summary of program graduates for 1989-1991. The reader is advised that University reporting periods do not correspond to our yearly listing of graduates.

	1989				1990				1991			
	Aug 88	Dec 88	May 89	Total	Aug 89	Dec 89	May 90	Total	Aug 90	Dec 90	May 91	Total
Majors:												
Earth Science	0	0	0	0	0	0	0	0	0	0	0	0
Geography	5	9	9	23	3	4	7	14	1	3	8	12
Geology	1	3	5	9	0	0	6	6	1	2	2	5
Minors:												
City & Regional Planning	2	2	2	6	0	1	1	2	0	1	0	1
Earth Science	0	1	0	1	0	0	0	0	0	0	1	1
Geography	2	2	5	9	4	2	4	10	1	1	6	8
Geology	1	2	1	4	1	1	1	3	2	0	2	4
Associates:												
Cartographic & Mapping Tech.	0	0	0	0	0	1	0	1	0	0	0	0
Meteorological Tech.	0	0	2	2	0	0	0	0	0	1	0	1
TOTAL	11	19	24	54	8	9	19	36	5	8	19	32

Student Credit Hours

Over six thousand student credit hours were generated for both Spring and Fall Semesters of 1991 (Table 5). This maintains the high level of enrollment since the Fall 1987 Semester.

TABLE 5
HISTORICAL PERSPECTIVE STUDENT CREDIT HOURS

	<u>Spr</u> <u>'88</u>	<u>Fall</u> <u>'88</u>	<u>Spr</u> <u>'89</u>	<u>Fall</u> <u>'89</u>	<u>Spr</u> <u>'90</u>	<u>Fall</u> <u>'90</u>	<u>Spr</u> <u>'91</u>	<u>Fall</u> <u>'91</u>
Geography	4,655	4,887	4,955	4,836	4,694	5,038	4,758	5,036
Geology	<u>1,452</u>	<u>1,420</u>	<u>1,533</u>	<u>1,363</u>	<u>1,523</u>	<u>1,499</u>	<u>1,507</u>	<u>1,532</u>
TOTAL	6,107	6,307	6,488	6,199	6,217	6,537	6,265	6,568

Upper division student credit hours increased slightly in the geography area and increased significantly in the geology area in the past year (Table 6).

TABLE 6
UPPER DIVISION STUDENT CREDIT HOURS
1987 - 1991

	<u>Geography</u>	<u>Geology</u>
Fall - 1987	799	168
Fall - 1988	895	151
Fall - 1989	723	174
Fall - 1990	825	144
Fall - 1991	877	214

Student Faculty Ratio

Reflecting the large increase in student credit hours and the significant service role the department plays in the University's educational delivery system, the Department's student/faculty ratio for Fall 1991 was 26.8. Table 7 details the department's student/faculty ratio between 1987-1991.

TABLE 7

**STUDENT/FACULTY RATIO
FALL SEMESTER 1987-1991**

	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>
Geography and Geology	24.6	27.2	26.7	28.8	26.8
Ogden College	17.7	18.3	19.2	19.7	19.2
WKU	18.2	18.2	19.3	19.5	19.6

Program Modifications and Course Developments

Two new courses were initiated in 1991. They were:

Geography and Geology 492 (G)	Spatial Analysis
Geography 493 (G)	Geographic Information Systems

In addition, after spirited debate the faculty voted to initiate an Earth Science Track within the Environmental Sciences Option of the Environmental Science Program. Given the myriad of course requirements in this new area, it will be interesting, if not educational, to see if it meets with success.

Mammoth Cave Summer Program

The Summer University at Mammoth Cave had seventy-four students enrolled in the five courses and workshops. The 1991 courses and instructors were:

Exploration of Mammoth Cave	- Dr. Stanley Sides
Karst Geology	- Dr. John Mylroie
Karst Hydrology	- Dr. William White & Dr. Nick Crawford
Speleology	- Mr. Roger Brucker
Karst Geo-Archeology of Mexico	- Mr. George Veni & Dr. James Brady

Participants of nineteen of the United States were represented in the 1991 program, including:

Tennessee	Kentucky	Michigan	Missouri
New York	Virginia	Texas	Pennsylvania
Ohio	North Carolina	Massachusetts	Illinois
Indiana	Florida	West Virginia	Iowa
Nebraska	Arkansas	Oklahoma	

*Other participants came from Washington D.C.

Sections and Course Enrollment Listings

Sixty-nine sections (not including the graduate component in 400 level courses) were offered in the Geography area during the Spring 1991 Semester. Student Enrollment totalled 1,807. Twenty-two sections (not including the graduate component in 400 level courses) were offered in Geology with an enrollment of 540. Fifty-five sections were offered in Geography during the Fall 1991 Semester with a student enrollment of 1,901. Geology offered 20 sections with a student enrollment of 563 for this period.

In the previously mentioned section listings are several evening and extended campus offerings. They include:

	<u>Evening Courses</u>	<u>Extended Campus</u>
Spring 1991	Geog 110 Geog 434 Geog 465 Geog 484 Geog 500 Geog 584	Geog 100 - Glasgow Geog 100 - Glasgow Geog 101 - Glasgow Geog 101 - Glasgow Geog 121 - Glasgow Geog 110 - Glasgow Geol 102 - Russellville
Summer 1991		Geog 100 - Glasgow Geog 100 - Russellville Geog 110 - Glasgow Geog 451(G) - Glasgow
Fall 1991	Geog 101 Geog 110 Geog 240 Geog 452 Geog 484 (G) Geog 504	Geog 101 - Glasgow Geog 100 - Glasgow Geog 110 - Glasgow Geog 360 - Glasgow

Detailed section listings for the Spring 1991 Semester and Fall 1991 Semester follows.

**GEOGRAPHY ENROLLMENT
SPRING 1991**

		<u>Sections</u>	<u>Total Students</u>
Geog 100	Intro. Man's Physical Env	11	528
Geog 101	Prin. Human Geography	10	352
Geog 110	World Regional	6	178
Geog 121	Meteorology	6	273
Geog 200	Intro. Latin America	1	2
Geog 222	Observation & Ana Meteorology	1	13
Geog 240	Intro. to Planning	1	13
Geog 300	Scope & Methods	1	8
Geog 315	Cartography	2	33
Geog 350	Economic Geography	1	31
Geog 360	Geography North America	3	71
Geog 404	Computer Mapping	1	17
Geog 416(G)	Remote Sensing	1	13
Geog 420	Geomorphology	1	13
Geog 424(G)	Applied Met. & Climatology	1	16
Geog 434	Historic Preservation Planning	1	14
Geog 451	Geography of Kentucky	1	49
Geog 465	Geography of Asia	1	10
Geog 471	Conservation	1	30
Geog 475(I)	Selected Topics Geography	2	8
Geog 480	Urban Geography	1	15
Geog 484	Planning Theory & Application	1	13
Geog 486	Environmental Seminar	1	1
Geog 491(G)	Data Analysis	1	3
Geog 495(I)	Planning Internship	1	2
Geog 500	Intro. Research	1	6
Geog 510	Selected Topics Geography	3	4
Geog 571	Quality of Life	1	4
Geog 580	Adv. Urban Geography	1	5
Geog 584	Planning Theory & Appl.	1	4
Geog 595(I)	Planning Practicum	1	2
Geog 599(C)	Maint. Matriculation	2	3
Geog 600	Maint. Matriculation	<u>1</u>	<u>1</u>
		69	1807

**GEOLOGY ENROLLMENT
SPRING 1991**

		<u>Sections</u>	<u>Total Students</u>
Geol 102	Intro Geology	8	373
Geol 111	Physical Geology	1	19
Geol 112	Historical Geology	1	25
Geol 113	Physical Geology Lab	2	39
Geol 114	Historical Lab	1	22
Geol 308	Structural Geology	1	12
Geol 309	Structural Lab	1	10
Geol 350	Petrology	1	7
Geol 375	Water Resources	1	16
Geol 420	Geomorphology	1	4
Geol 450(G)	Stratigraphy - Sedimentology	1	6
Geol 475	Selected Topics Geology	2	5
Geol 486	Environmental Seminar	<u>1</u>	<u>2</u>
		22	540

**GEOGRAPHY ENROLLMENT
FALL 1991**

		<u>Sections</u>	<u>Total Students</u>
Geog 100	Intro. Man's Physical Env.	9	509
Geog 101	Prin. Human Geography	9	345
Geog 110	World Regional	5	216
Geog 121	Meteorology	4	227
Geog 122	Aviation Meteorology	1	11
Geog 200	Intro. Latin America	1	9
Geog 240	Introduction to Planning	1	8
Geog 300	Scope and Methods	1	16
Geog 310	Hydrology	1	12
Geog 315	Cartography	1	22
Geog 328	Climate, Soils and Vegetation	1	34
Geog 350	Economic Geography	1	24
Geog 360	Geography North America	3	79
Geog 426(G)	Meteorology/Climatology	1	14
Geog 451(G)	Geog. of Kentucky	1	24
Geog 452	Field Studies	1	7
Geog 471	Conservation	1	16
Geog 475(I)	Selected Topics Geography	3	6
Geog 479(G)	Ind. & Commercial	1	17
Geog 484(G)	Planning Theory & Application	1	10
Geog 491(G)	Data Analysis	1	18
Geog 492(G)	Spatial Analysis	1	19
Geog 495	Planning Internship	1	2
Geog 502	Field Work	1	11
Geog 510	Selected Topics Geography	1	6
Geog 571	Quality of Life	1	1
Geog 599	Thesis	1	1
Geog 600	Maint. Matriculation	1	1
		<u>55</u>	<u>1901</u>

**GEOLOGY ENROLLMENT
FALL 1991**

		<u>Sections</u>	<u>Total Students</u>
Geol 102	Intro. Geology	7	373
Geol 111	Physical Geology	1	49
Geol 113	Physical Geology Lab	2	48
Geol 295	Intro. to Research Methods	1	1
Geol 310	Hydrology	1	20
Geol 330	Mineralogy	1	16
Geol 380	Field Work	1	2
Geol 405	Paleontology	1	10
Geol 415(G)	Environmental Geology	1	9
Geol 475	Selected Topics Geology	2	2
Geol 480	Coal Geology	1	6
Geol 485	Spatial Analysis	<u>1</u>	<u>1</u>
		20	563

STUDENT CO-OP/INTERN PROGRAM - 1991

Name of Student	Major	Employer	(City,State) Location	Salary
Keirsten Jagers	Geography	BRADD	Bowling Green, KY	yes
Mark Stonex	Geography	BRADD	Bowling Green, KY	yes
Gregory Langeliers	City & Regional Planning	City Planning	Gallatin, TN	yes
Mark Freer	City & Regional Planning	City Planning	Owensboro, KY	yes
Tom Springer	Geography	Hardin County Planning	Elizabethtown, KY	yes
Gloria Bullock	Geography	Warren County/ Bowling Green City Planning	Bowling Green, KY	no
Dana Cosby	Geography	BRADD	Bowling Green, KY	yes
Joe James	Geography	Center for Local Government	WKU	yes
Paul Nichols	Geography	Center for Local Government	WKU	yes
Michael Dant	Geography	BRADD	Bowling Green, KY	yes
Lisa Thompson	Geography	Center for Local Government	WKU	yes
Richard Bergen	Geography	Metropolitan Planning Office	Nashville, TN	yes
Doug Stevenson	City & Regional Planning	Chamber of Commerce Economic Devel- opment Institute	Bowling Green, KY WKU	yes yes
Freida Moore	City & Regional	BRADD	Bowling Green, KY	yes

STUDENT AWARD WINNERS

1992

OUTSTANDING SENIOR AWARD

Geography

Leslie F. Shaffer

Geology

David Lee Doyle

OUTSTANDING GRADUATE STUDENT

Geography

Michael Horsley

City and Regional Planning

Joseph McGarry

OUTSTANDING MEMBER - GAMMA THETA UPSILON

Christina Daub

PUBLICATIONS AND PROFESSIONAL REPORTS BY STUDENTS

- Britton Dotson, Mike Horsley and Brad Stevenson (with Nicholas C. Crawford), "Karst Groundwater Flow in the Vicinity of the Ned Gray Toxic Waste Site and Blue Lake Quarry, Hopkinsville, Christian County, Kentucky," prepared for O.H.M. Corporation and U.S. Environmental Protection Agency, September, 1991, 41 p. and 3 plates.
- Kristi Baxley, "The Geography of Kentucky Climate Stations," 1990 Proceedings, Geography Section, Kentucky Academy of Science, 1991, pp. 40-48.
- Mike Horsley, Bill Howcroft, Jim Smith and Mark Gottlieb (with Nicholas C. Crawford), "Karst Groundwater Flow in the Vicinity of Thomas Industries, Inc. Hopkinsville, Kentucky," prepared for Thomas Industries, Inc. and Dames and Moore, September, 1991 92 p. and 20 plates.
- James H. Smith (with Nicholas C. Crawford), "Revised Groundwater Monitoring Plan for a Proposed Petroleum Waste By-products Land-treatment Facility, Triple M Farms, Simpson County, Kentucky," prepared for Northamerican Environmental Services, Inc., February, 1991, 11 p.
- James H. Smith (with Nicholas C. Crawford), "Preliminary Karst Hydrogeologic Investigation of the Proposed Site for the Advanced Technology Center, Morgantown Road and Loop Drive, Bowling Green, Kentucky," prepared for Smith and Associates, March, 1991, 155 p.
- James H. Smith (with Nicholas C. Crawford), "Dye Traces to Determine if Leachate from the Curtis Peay Landfill Is Contaminating the Joe Schultz Water Well," December, 1991, 12 p.
- Barry Vann, "Factors Affecting Wood Fuel Consumption in Warren County, Kentucky," (co-authored with Conrad Moore), 1990 Proceedings, Geography Section, Kentucky Academy of Science, 1991, pp. 23-32.
- Gregory Willoughby, "The Effects of Air Temperature on Soil Temperature," 1990 Proceedings, Geography Section, Kentucky Academy of Science, 1991, pp. 49-58.

STUDENT PRESENTATIONS

- Britton Dotson (with Nicholas Crawford and Mark Rigatti), "The Use of Groundwater - Level Measurements and Dye Tracing to Determine the Route of Groundwater Flow from a Hazardous Waste Site in an area of Karst in Hardin County, Kentucky," Third Conference on Hydrogeology, Ecology, Monitoring and Management of Groundwater in Karst Terranes, sponsored by U.S. Environmental Protection Agency and National Ground Water Association, Nashville, Tennessee, December, 1991.
- David Doyle, "Geomorphology and Hydrology of Robey Swamp and Sulphur Spring Creek Drainage Basin, Simpson County, Kentucky," Sigma Xi Research Conference, April, 1991.
- William Howcroft, "Evaluation of Groundwater Contamination Vulnerability in the Bowling Green, Kentucky Area Using DRASTIC Methodology and Geographic Information Systems," Sigma Xi Research Conference, April, 1991.
- William Howcroft (with Nicholas Crawford), "Springhead Protection Study of the Shakertown, Summers and Auburn Springs Groundwater Basins, Logan and Simpson Counties, Kentucky," Kentucky Academy of Science Annual Meeting, Owensboro, November, 1991.
- Rodney Jones, "Geographic Information Systems Applied to the Management and Modification of Districts (Specifically Bowling Green School Districts)," Annual Meeting, Kentucky Academy of Science, Owensboro, November, 1991.
- Kelly Kaletsky, "Measurement of the Effects of the Snowball Dining Area on the Microclimate of Mammoth Cave," Sigma Xi Research Conference, April, 1991.
- Joseph McGarry, "An Investigation of Racial Segregation in Bowling Green, Kentucky," Annual Meeting, Kentucky Academy of Science, Owensboro, November, 1991.
- James H. Smith, "In Search of the World's Deepest Cave," poster paper, Sigma Xi Research Conference, April, 1991.
- James H. Smith and William Howcroft (with Nicholas Crawford), "DRASTIC: An Assessment of Groundwater Pollution Vulnerability in Warren County, Kentucky," poster paper, Sigma Xi Research Conference, April, 1991.
- James H. Smith (with Nicholas Crawford and Ginny Gray), "Karst Hydrogeology of the Fort Hartford Mine Superfund Site, Ohio County, Kentucky," poster paper, Sigma Xi Research Conference, April, 1991.
- Brad Stephenson, "Geology of a Multi-Level Maze Cave Beneath the Black Hills: Wind Cave National Park, South Dakota," Sigma Xi Research Conference, April, 1991.

STUDENT SATISFACTION WITH THEIR MAJORS IN THE DEPARTMENT OF GEOGRAPHY AND GEOLOGY - 1991

During the Spring 1991 Semester, a University-wide survey of students was conducted concerning their satisfaction with academic majors (Table 8). We are pleased to report that in all but three items our majors ranked the Department of Geography and Geology programs higher than comparable units in the College and University. Some 95% of our major respondents agreed or strongly agreed on the overall quality of the department. This compares to an 85% rating for the College and an 81% rating for the University. A similar pattern was found for such key items as quality of career advising, quality of courses in preparing students for grad-prof school, and quality of instructors in upper level and lower level courses in the major.

While there is room for improvement, the consistent superior rankings are gratifying. Nevertheless, we will be analyzing the results in the coming academic year to determine where improvements are required.

TABLE 8

COMPARISON OF UNIVERSITY-WIDE AND COLLEGE -WIDE RATINGS OF STUDENT SATISFACTION WITH MAJOR AREA FOR THE GEOGRAPHY AND GEOLOGY DEPARTMENT

Regarding my major area, I am satisfied with the:

	<u>Percent "Agree" or "Strongly Agree"</u> <u>University</u> <u>Rating</u>	<u>College</u> <u>Rating</u>	<u>Department</u> <u>Rating</u>
a. overall quality of this department	81%	85%	95%
b. quality of instruction in lower level courses in major	76%	80%	89%
c. quality of instruction in upper level courses in major	74%	78%	79%
d. opportunities for interaction with departmental faculty	65%	72%	79%
e. professional competence of departmental faculty	75%	78%	84%
f. quality of courses in preparing me for employment	66%	74%	74%
g. quality of courses in preparing me for grad-prof school	60%	70%	73%
h. availability of my advisor	63%	69%	90%
i. quality of course selection advisement in major	63%	69%	89%
j. quality of career advising in my major	51%	58%	74%
k. quality of printed information on requirements and options in my major	61%	63%	83%
l. helpfulness of the office staff	66%	68%	80%
m. fairness of grading in my courses	69%	73%	79%
n. availability of professional activities/clubs in major	59%	64%	65%
o. availability of required courses for major	62%	63%	68%
p. availability of desired courses for major	59%	61%	68%
q. practicum or internship experiences in major	46%	48%	41%
r. laboratory facilities related to the major	52%	68%	70%
s. quality of students in the program	76%	79%	80%
t. classroom facilities related to the major	68%	73%	65%
u. clarity of degree requirements in the major	69%	73%	65%
v. opportunities for student participation in department decisions	27%	29%	37%
w. opportunities for involvement in department activities outside of the classroom	44%	48%	65%
x. opportunities for formal student evaluation of instruction in major	57%	59%	75%
y. the personal interest of faculty in students	66%	70%	75%
	N= (1727)	(466)	(20)

Percentages may vary + or - 1% from individual percentage totals from rounding error. Data suppressed if N<6.

OUTCOMES ASSESSMENT REPORT 1991 -1992

During the past academic year, the Department of Geography and Geology has been actively involved in outcomes assessment. Specifically, measurements of student and program success have been developed for the Geology, Earth Science, and the Geography undergraduate major and the Master of Science degrees in Geography and in City and Regional Planning.

Procedure

Basically, the assessments for all the cited programs took the same form. Namely:

- a curriculum-career satisfaction survey was taken of all alumni--over 800 graduates.
- internship evaluation forms were surveyed for the past five years.
- the productivity of students in professional research and public service was surveyed for the past five years.
- the productivity of faculty in professional research and public service was surveyed for the past five years.

Results

The results of our alumni survey and data collection reveal:

- a highly satisfied and complimentary alumni.
- employers who are quite satisfied with our students in their internship assignments. Indeed, many of the agencies have directly employed our students or assisted them in their search for suitable employment.
- students in the department have published 145 items and presented 85 professional papers in the past five years--an outstanding effort.
- faculty in the Department of Geography and Geology published 111 articles, 118 technical and consulting reports, and 75 abstracts between 1987-1991. They attended professional meetings (248 instances) and attended professional workshops (77 instances). As a group, the faculty generated over \$1,000,000 in external grants, contracts, and donated equipment for the cited period. This publication and grant activity help assure the objectivity and relevance of the classroom presentation and fit the model of a complete faculty member which was developed in the recent Western XXI Strategic Plan.

Outcomes

All the data generated reflected positively on the various programs in the department. We are now in the process of re-evaluating our undergraduate curriculum based partly on the alumni surveys and student opinions generated during the past year.

GRADUATE STUDENT/FACULTY SEMINAR

During the past year, the faculty of the Department voted to develop a student/faculty seminar. Please find below the procedures that have been developed for the seminar.

I. Purpose

The departmental seminar is designed to serve as a forum for scholarly interaction among all faculty members, among graduate students, and between faculty and graduate students.

II. Seminar Organizing Committee

The committee will consist of two faculty members and one graduate student. Faculty members will serve two-year terms, and the terms will be staggered so that one faculty member will be replaced on the committee each year. The faculty member in the second year on the committee will serve as chairperson. The graduate student member will be selected by the chairperson and will serve a one-year term.

The committee is responsible for producing and distributing the seminar schedule each semester. The schedule will be distributed by the end of the first week of the semester. Scheduling will include obtaining commitments for presentations from members of the faculty, graduate students, and other appropriate individuals as determined by the committee.

The committee chairperson is responsible for keeping a record of attendance by graduate students in residence and supplying this record to the students' advisors after each semester.

III. Schedule of Meetings

The seminar will normally meet at least once a month during the academic year. The committee will select dates, times, and locations for the meetings. Meetings will be scheduled to last one hour.

IV. Participation

All faculty and graduate students in residence are expected to attend seminar meetings on a regular basis.

Members of the faculty are expected to present at least one seminar every three years.

Each graduate student will be required to present at least one seminar (which may be on the student's thesis research or major research paper) during his/her tenure in residence. Graduate students are also encouraged to present other research work as deemed appropriate by the committee.

Other presentations may be invited by the committee. Seminars will be open to outside guests.

**FACULTY/GRADUATE STUDENT SEMINAR SERIES
1991 FALL SEMESTER SCHEDULE**

- September 13 L. Michael Trapasso,
Associate Professor of Geography

*"The Relationships between Barometric Pressure and the Timing of
Human Childbirth"*
- September 27 Mark Lowry, II,
Professor of Geography

*"Observations on the Middle East: Travels in Egypt and the Gulf
States"*
- October 11 Thomas J. Algeo,
Department of Geology, University of Cincinnati

*"Lower-Middle Pennsylvanian Gobbler Formation: Using Carbonate
Shelf Cyclicity to Unravel Basin History"*
- October 25 William Howcroft,
M.S. Candidate in Geography

*"A Wellhead Protection Study for the City of Auburn, Logan County,
Kentucky"*
- Mark Gottlieb,
M.S. Candidate in Geography

"Some Current Efforts to Improve Interpretation of Dye Trace Results"
- November 22 Chris Groves,
Instructor of Geography

"Environmental Impacts of Acid Mine Drainage in Karst Terrains"

**FACULTY/GRADUATE STUDENT SEMINAR SERIES
1992 SPRING SEMESTER SCHEDULE**

- January 29 Dr. Conrad Moore
 Professor of Geography

 *"A Geographic and Chronological Analysis of Droughts in the Con-
 tiguous United States"*
- February 17 Ms. Mary Prante
 University of Kansas

 *"The Evolution of the Landscape of Kansas: An Application of Geo-
 graphic Information System Methodology and Computer Modelling"*
- February 21 Mr. Mark Kumler
 Dartmouth College

 "A Comparison of Regular and Irregular Digital Terrain Models"
- February 28 Dr. Richard Finch
 Tennessee Technological University

 "The Geology of Impact Structures of Tennessee"
- April 1 Dr. James L. Davis
 Professor of Geography

 "Transportation Facilities and Planning in Warren County, Kentucky"